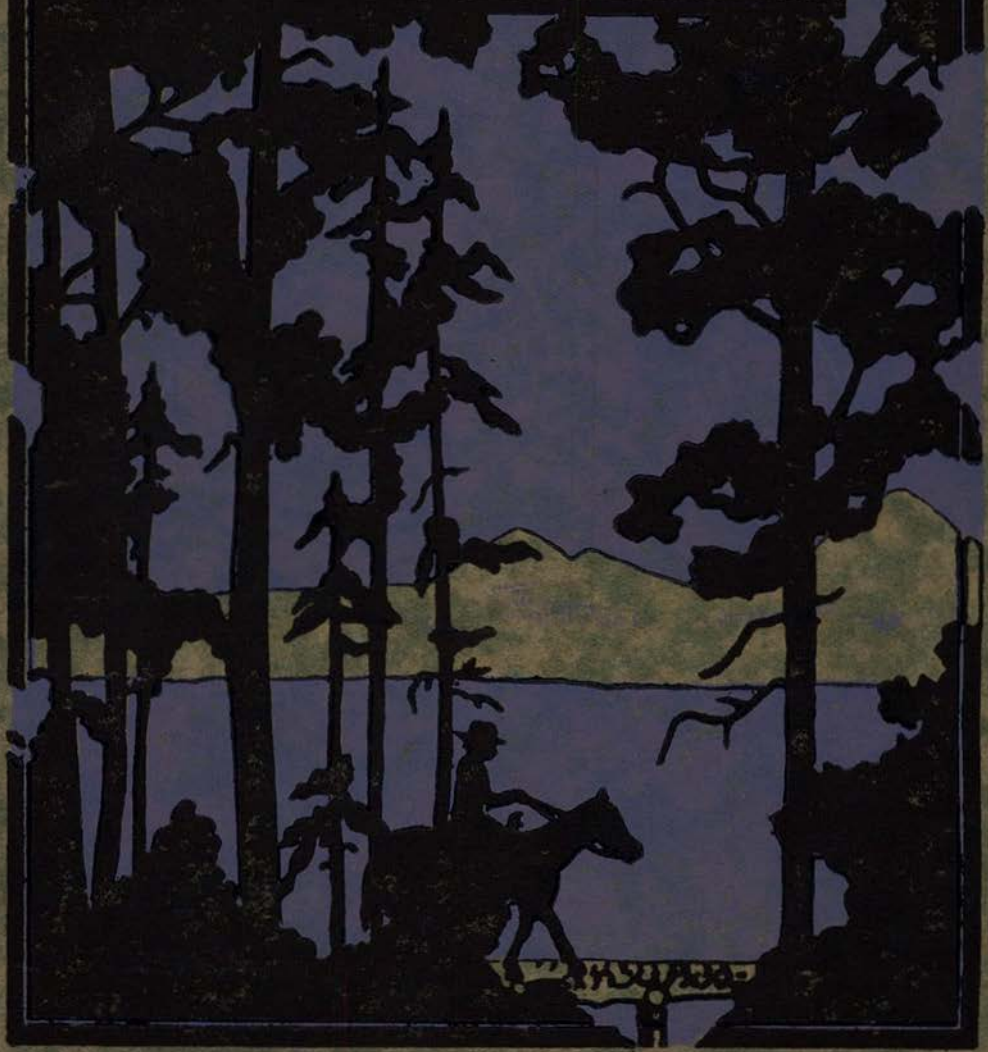


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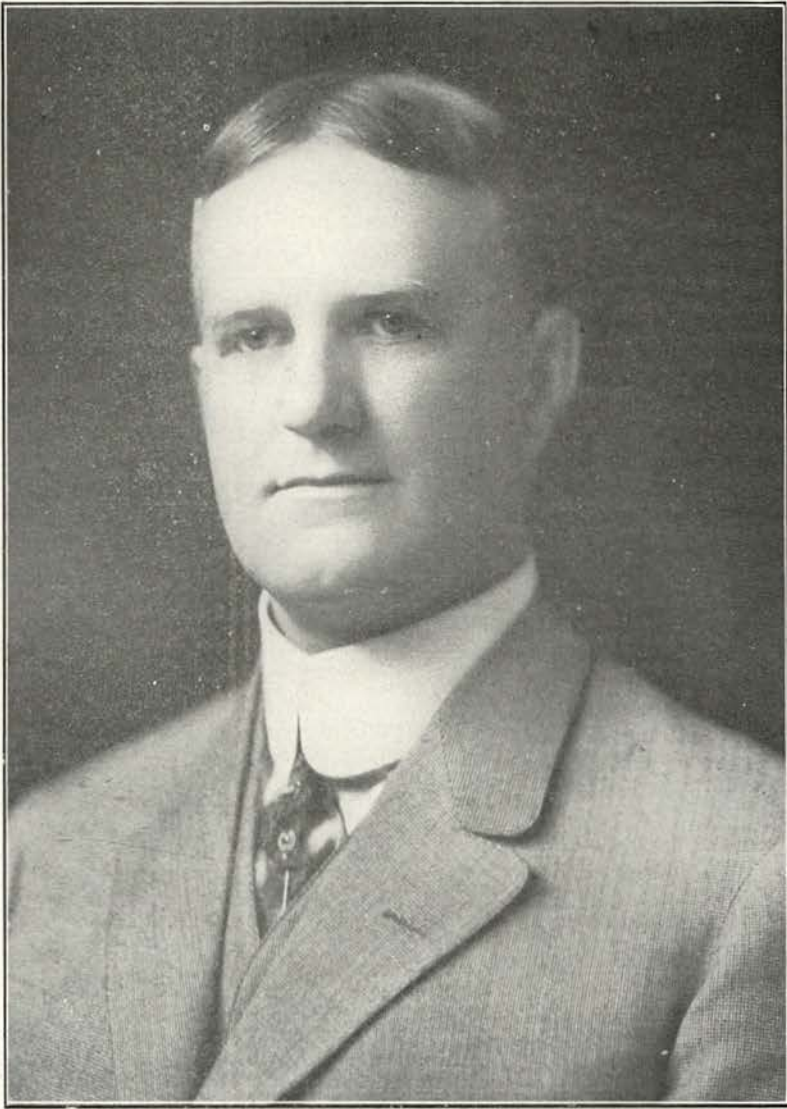
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Dedicated to

WALTER D. HUMISTON

Assistant General Manager, Potlatch Lumber Company

who, by his ability, energy and vision, has proven a leader in the interests of forest conservation not only in Idaho but also in the entire Northwest.

FOREST TAXATION

By W. D. HUMISTON

Assistant General Manager, Potlatch Lumber Company

About fifty years ago a few people in the United States began to think and talk about "Timber Taxation." Some years later the inevitable result of the application of the General Property Tax System to forests was pointed out.

But in those days we knew little or nothing about any of the methods and theories of taxation which have since come into vogue, like the taxation of intangibles, choses in action, incomes, net profits, excess profits and inheritances. The general property tax was used almost exclusively as a means of producing the necessary revenues for states, counties and municipalities and, while it was freely admitted that it was not fair or equitable or good economics to tax a growing crop of timber each year for a hundred years or more, it was felt that taxes on timber were not then excessive or very burdensome. As a matter of fact, they were not. Twenty-five years ago the expenses of government were on a very moderate scale as compared with those of the present time so that the burden of a tax on timber which was unjust and uneconomic in theory and practice really had very little bearing on our timber supply or on its rate of depletion. Stumpage was cheap and our timber supply seemed inexhaustible.

Up to this time our forests have been exploited with little thought for the future. Nor must this charge be made against the lumbermen alone. Here in Idaho thousands of acres of fine timber have been cleared off for farms. My grandparents cleared a quarter section for a farm in southern Ohio and destroyed hundreds of thousands of feet of the choicest black walnut timber or made log barns and corn cribs and fence rails of it. Forest fires, which have been caused by human carelessness and often by men who had an utter disregard for the property or safety of others, have annually destroyed billions of feet of timber. But these conditions can not last much longer. Before many more years have passed we will be compelled to plant and protect trees and grow our timber----or else import it at prices which will make any lumber prices we have heretofore seen pale into insignificance.

There are tremendous areas in the United States where there are stands of timber of valuable species which are now just under merchantable size. Many large areas on which logging is now being carried on have considerable stands of so-called "advance growth" which is just too small to be of commercial value at this time. If allowed to grow for a very few years longer, this timber, which is from twenty-five to seventy-five years on its way to full maturity, will defer our ultimate timber famine a good many years and will furnish the cheapest supply of timber the next generation will have.

But this young timber will never reach maturity unless protected from forest fires and attacks of fungi and insects. Such protection is very expensive, especially in northern Idaho, where fire protection costs will average ten cents an acre a year and have recently run as high as forty-two cents an acre. Such costs, plus necessary administrative expenses, plus the accumulated interest and inevitable losses, will make a charge against this timber which will be so high as to make private individuals and corporations very chary of such commitments of their funds if, in addition, the resulting crop and the land it is grown on is to be taxed each and every year until the timber is cut.

In discussing this phase of the taxation of timber, the Massachusetts Department of Conservation, Division of Forestry, recently said:

"A crop of corn takes eighty days to mature. If the corn crop were taxed every day it would amount to the same burden on the owner as the present method of taxing forest land every year."

Probably the greatest trouble with the present method of taxing timber and timbered land is the fact that there is usually little or no income from the property itself with which to pay the costs of fire protection, administration and taxes.

The assessed valuation of timber and timbered land is usually determined in the most haphazard, unjust and inequitable way. In most instances the assessment is pure guess work. Political expediency is frequently of greater influence than considerations of jus-

tice and equity. It is quite common here in Idaho to find that, when a lumber company buys a timber claim, the assessed valuation is increased from one hundred to four hundred percent over what it was when the same tract was owned by an individual---especially if the owner was a resident voter in the county where the timber is located. In some of our counties practically the only land on the assessment rolls assessed as timbered land is that owned by corporations. Occasionally one can find a timbered tract belonging to a private individual assessed as such, but investigation nearly always develops the fact that the owner is a non-resident. Literally thousands of acres of good timber, owned by resident voters, are assessed year after year as Grazing Land, Cut-over and Burned Land, etc.--any classification which will take the tax burden off the shoulders of the voter-owner.

Probably not one corporation's petition in twenty for relief from such conditions is granted by our County Boards of Equalization, no matter how conclusive the evidence which is produced in support of the petition for relief.

The increases in tax levies for common schools, hard surfaced roads and many other purposes have been large and frequent during recent years and there seems to be no relief in sight.

Taxing Idaho's largest bodies of privately owned timber and the land it grows on year after year at a high assessed valuation, as compared with that of other classes of property, is bad enough, but, when the taxing authorities, boards of equalization and general public all conspire to saddle the maximum tax burden onto this class of property, it doesn't take a prophet or financier to see that exploitation of the timber will be as rapid as possible and that private reforestation, or even continued protection of "advance growth," will wait on the day when timber, timbered lands and lands which are reforesting are assessed and taxed more justly and on an entirely different basis than at present.

I have tried to outline in a rather broad general way what the matter is with our present system of forest taxation and how the general property tax system, as applied to this class of property, is further frequently complicated by ignorance, inefficiency and the deliberate intent of taxing officers and boards of equalization to tax the corporate timber

owner every cent it will stand or can be made to pay.

Naturally, the question arises as to what are the alternatives and what the best methods of taxing privately owned timber, timbered lands and tracts which are reforesting.

This question has been very seriously considered for a number of years by some of the best minds in the country. In the spring of 1908 President Roosevelt appointed the National Conservation Commission and Fred Rogers Fairchild, Professor of Political Economy in Yale University, was appointed Chairman of the Committee on Forest Taxation. With the assistance of the United States Forest Service a large amount of material was collected and the problem was clearly defined and carefully studied.

The same year the National Tax Association, the membership of which is made up almost entirely of members of State Tax Commissions, Professors of Political Economy of many of our largest Universities and students of taxation and economics, took up the study of Forest Taxation. Professor Fairchild read a paper on the subject at the Toronto Conference of the National Tax Association in October 1908. Mr. A. C. Shaw, Principal Examiner of the United States Forest Service and Dean B. E. Fernow, of the Faculty of Forestry, University of Toronto, also presented papers on this subject at the same conference. So 1908 is really a very important year in the annals of reform in Forest Taxation. While Professor Fairchild, Mr. Shaw and Dean Fernow each approached the problem from different angles, they all agreed that a crop of timber and the land it is grown on should not be taxed every year at full rates for the entire period that the crop is maturing.

The Toronto Conference of the National Tax Association and the National Conservation Commission seem to have done more to focus attention on the problem of proper Forest Taxation than had been accomplished previously by the combined efforts of everyone who had studied and discussed Forest Taxation.

Professor Fairchild has remained as Chairman of the Committee on Forest Taxation of the National Tax Association continuously, I believe, since 1908 and his committee has made several reports, notably that delivered at the Minneapolis Conference last fall.

In April 1910, Governor M. E. Hay, of Washington, appointed a Commission on Forest Legislation to consider and report upon needs for legislation in relation to the forests of

the State, handling of forest products, the logged-off land problem, reforestation and forest taxation. At the first meeting of the Commission Professor F. G. Miller, then of The School of Forestry of the University of Washington, now Dean of the School of Forestry of the University of Idaho, was unanimously elected Chairman of the Committee on Forest Taxation.

The Commission made its report and recommendations to the Governor in November 1910. The entire report is well worth reading, even after nearly thirteen years have elapsed since its publication, but that part of the report which covers Forest Taxation, and which I have good reason to believe was written in its entirety by Dean Miller, stands as a classic and it is unquestionably one of the best things that has ever been written on the subject. All students of taxation, and particularly of Forest Taxation, should read this report carefully.

In 1921 the Legislature of Oregon directed Governor B. W. Olcott to appoint a committee of seven to gather information, formulate recommendations, prepare proposed legislation and report to the Governor upon public revenues and the feasibility of raising revenues from other sources than those theretofore used.

Governor Olcott appointed a strong and thoroughly representative committee, including Colonel C. S. Chapman, Forester of the Western Forestry and Conservation Association. The Committee impressed into service as advisers Dr. James H. Gilbert, Professor of Economics of the University of Oregon, and Dr. Hector Macpherson, Professor of Economics and Sociology of the Oregon Agricultural College.

The report to the Governor was presented last December just prior to the convening of the Oregon Legislature. It is very comprehensive and has been so carefully prepared and presented and covers the subject so thoroughly that it might well be used as a text book. Those parts of the report covering the taxation of forests, cut-over land and land which is reforesting bear all the earmarks of having been written by Colonel Chapman and are especially interesting to students of Forest Taxation.

It will be seen that some of the best minds in the country have been studying the problem of Forest Taxation and collateral subjects intensively and systematically since 1908. At intervals of a few years a contri-

bution of outstanding merit and importance has been brought out. With Dean Miller's report of 1910, the report of the Committee on Forest Taxation to the National Tax Association at Minneapolis last year, and with the recent report of the Oregon Committee on Tax Investigation, we have what seems to me to be the last word on this important subject.

So far as I have been able to ascertain everyone who has ever given the subject of Forest Taxation any study agrees that immature timber can not stand to be taxed under the General Property Tax System every year it is growing and until it is cut. When the land on which the timber is growing is also taxed each year, the situation is made just that much worse.

Writers on Forest Taxation generally divide the subject into separate problems: (a) the taxation of immature forests; and (b) the taxation of mature forests. The taxation of mature forests should be further subdivided so as to separate the mature forest which is accessible and can be logged at any time, as far as location is concerned, from the mature forest which is inaccessible and, therefore, could not be logged under any circumstances until it is reached by the development of transportation facilities.

As to the proper method of taxing immature growing timber Dean Miller's Committee recommended in 1910 that "the State should exempt both the land and the growing crop from taxation till the timber is cut---the accumulated tax on both then to be assessed against the timber."

Professor Fairchild's Committee recommended last fall that:

- "(1) The Law shall provide criteria for determining what is "mature timber."
- (2) All trees other than mature timber shall be exempt from taxation, and in assessing land no account should be taken of the value of any trees except mature timber. Forest lands shall be assessed no higher than similar bare lands in the neighborhood.
- (3) All forest products (with the exception of certain small quantities taken by the owner or the tenant for his own use) shall be subject to a yield tax at a rate corresponding to the business tax on other businesses. The rate would perhaps ordinarily be in the neighborhood of 5 per cent. The yield tax should be administered by

state officers, and the proceeds distributed to the towns or counties.

- (4) It is assumed that if there is an individual income tax, forest incomes will be treated exactly like other incomes."

The Oregon Committee on Tax Investigation recommended the passage of a law which would provide that cut-over or burned-over land or any forest land on which there is young or "advance" timber growth which meets the requirements of the State Forester may, at the option of the owner, be classified as "Reforestation Land." There would be no time limit for such classification until the timber reaches maturity, and so long as the owner complies with the forest fire and forest patrol laws of the State.

When the State Forester has classified any land as Reforestation Land and so certified to the County Assessor "said land and the forest growth then or thereafter thereon shall be separated for taxation purposes as long as said classification continues. The Assessor when making the annual assessment shall assess only the value of the land alone, not enhanced by reason of forest growth thereon, and upon no higher basis than the minimum rate at which he assesses wild and unforested land of the same character not separately classified under this act." Of course the prevailing rate of tax levied against all other classes of property would then be levied against such Reforestation Land,

As to the method of taxing mature timber Dean Miller's Committee found that "a change in the method of taxation which would lay an annual tax on the land, and a yield tax on the timber when it is cut, would be highly to the interests of the State as a whole, in that it would aid distinctly in perpetuating the forest as a resource."

Professor Fairchild's Committee's last report says regarding the assessment and taxation of mature timber:

"The mature forest presents quite another problem. We are here dealing with a full grown product. Two cases appear, depending primarily on whether the timber is actually marketable or not. By marketable timber we mean mature timber which is accessible and so located, with respect to market and transportation facilities, that its immediate marketing is possible. Whether it actually is being marketed depends upon the owner's judgment as to the most favorable time. There is nothing in the theory of the property tax to affect adversely mar-

ketable mature timber. A property tax fairly drawn and administered with even-handed justice upon all owners of taxable property would give the owner of such mature timber no ground for complaint. Of course the obvious rejoinder is: 'there ain't no such animal.' This ideally perfect property tax exists only in the imagination. The real property tax, as we know it, is badly drawn and more badly administered. Its application is unequal and unjust. If forests of marketable mature timber are taxed more heavily in proportion to their true value than other classes of wealth, the forest owners have a grievance, but it is in no way different from the grievance of any other property owner, under similar treatment.

"On the other hand, when timber is so located that its present marketing is not possible, the situation is in theory similar to that of the growing forest. We have here a form of capital whose income is deferred to the more or less distant future. It is true that the timber is mature, but if other causes beyond the owner's control defer its marketing, the result is the same. It is the fact of the necessarily deferred income, rather than the particular cause of that fact, which makes the annual tax on capital value work injustice. The reasoning in support of this conclusion has been presented heretofore in other reports by the chairman. There are in certain parts of the United States large forest areas containing mature timber whose location is so inaccessible or so remote from markets or transportation facilities that its marketing is now and may long continue to be a physical impossibility. To collect from such forest capital an annual property tax, assessed upon the true value from year to year, places an excessive burden upon the owners. This result is inherent in the nature of the property tax and not (as in the case of marketable timber) due to faulty wording or administration of the law. * * * *

"In seeking a solution your committee starts with these principles: (1) Mature timber should be taxed so far as is equitable and possible on a par with other wealth and business. (2) If there is an individual income tax, it should relate to forest income the same as any other income. (3) Where there is a special business tax, it should take the form of a yield tax for forest enterprise. These principles are the

same as have been recommended for growing forests and their discussion in that section applies generally here. (4) The property tax as applied to marketable mature forests should be the equivalent of an annual tax upon the land and trees, assessed in the same ratio to true value as prevails for other taxable property in general, and at the same rates as are applied to other wealth. (5) The property tax, when applied to forests of mature timber which will not be marketable till some time in the future, should take account of the fact of deferred income. * * * * *

"From the point of view of the forest owner, the most favorable solution would probably be the pure yield tax, but the pure yield tax will not do, for two reasons at least. (1) The owner of marketable mature timber, who chooses to hold it uncut, for sale in the distant future or as a pleasure park or hunting ground, must not be permitted thus to postpone his tax contribution indefinitely or avoid it altogether. (2) The resulting irregularity of public revenue would be a serious matter, especially in those localities where virgin timber composes a large part of the taxable wealth, these being the very communities where the problem of the taxation of mature timber is most acute. As has been observed heretofore in this report, there are ways of adjusting this irregularity of revenue, but nevertheless the public appears unwilling to take the chance. There are other serious difficulties, both theoretical and practical. We are quite safe in concluding that the pure yield tax is not the solution. * * *

"Taking everything into consideration, your committee is of the opinion that the only practicable solution of the problem of taxing the mature forests is to seek to make the property tax as equitable and convenient as may be. In particular every effort should be made to insure a fair assessment of forest property. This means not only an accurate valuation; it requires also that the assessed value of forest property shall not bear a higher ratio to its true value than the prevailing ratio of assessed valuation to true value of all taxable property. Assessment at the hands of a state officer or board would doubtless assure uniformity and certainty in the assessments. There is always the danger however, that such efficient assessment, by arriving at the true value of forest property, will unjustly bur-

den such property, as compared with other property not so efficiently assessed. Equality in taxation must be real equality, not merely formal.

It is admitted that this solution is more favorable to the forest of marketable timber than to that which is for the present not marketable. But the committee has thus far been unable to discover a practicable means of reconciling this discrepancy."

The Report of the Committee on Tax Investigation of Oregon says:

"A survey of the situation in this state leads to the conclusion that mature forests must continue to be assessed and taxed under the general property tax. The great outstanding reasons for this are that many counties are largely dependent for revenue on taxes secured from timber properties. To make any change at this time in line with modern thought in forest taxation would work hardship on timber counties where little exploitation is going forward. From the standpoint of the taxpayer, complicated adjustments would also be necessary as most timber has been paying taxes for a long period and in some localities very heavy taxes have been the rule the past decade. Any yield tax basis would of necessity be obliged to recognize what has taken place in the past and would lead to complicated cases involving heavy administrative costs. That taxation of mature timber presents a distinct and difficult problem is borne out by a recent report of the committee on forest taxation of the National Tax Association. Professor Fred R. Fairchild, an economist of recognized standing is chairman of this committee. * * * * "

The report then quotes at considerable length from the Fairchild report which it evidently approves.

From the foregoing it will be seen that there is agreement between different authorities as to the necessity for reform in the method and basis of forest taxation, especially as to land which is reforestation. While the specific recommendations vary somewhat, the broad underlying principles are much the same.

Two great obstacles stand in the way of reform in forest taxation, however. One is the fact that in Idaho, as well as in all of the other northwestern states, a Constitutional Amendment would be required before it would be possible to assess and tax timber and reforestation lands on any basis other than that

which applies on other classes of real property. Constitutional Amendments are always difficult to pass and one relieving timber of any taxes, or even deferring the time when taxes on growing timber would be collected could not possibly pass until the general public had been very fully informed of the necessities and exigencies of the situation. The other obstacle is the fact that many counties and all of our northwestern states derive such a large share of their incomes from timbered lands that any change in the time of collecting such taxes which would postpone the collection for a term of years would seriously disarrange their finances.

Lumber operations on a large scale were begun in Idaho twenty years too soon, for our Idaho mills have been at such a disadvantage when compared with the advantages of cheap labor, long hours of work and low freight rates enjoyed by southern lumbermen and ocean transportation, foreign markets and

the comparatively cheap logging on the heavily timbered tracts of the Coast operators, that most of the time during the last two decades our local mills have just broken even or else have operated at a loss.

From now on, however, I look to see better times for our Idaho lumbermen and considerable development in this State. This means that the time is not now far distant when tax reform, as applied to cut-over and reforestation land at least, must come or Idaho will lose an annual payroll of \$10,500,000.00, as well as the \$2,000,000.00 which is paid by the lumbermen every year to resident farmers for agricultural products and we shall have a great many ills to contend with that we know nothing of now.

If we settle the tax problem right and soon and keep forest fires out of our growing timber, Idaho can have a supply of timber sufficient for its own needs for all time, with a very substantial surplus left over for sale in the eastern markets.

THE RANGER SPEAKS

Have you followed the trail winding upward
From canyon and forest to peaks
From the cool, sweating damps of the cedar
To sky-lofts the bald eagle seeks?

Has your back felt the weight of a pack-sack
Have your mocassined feet felt the trail
With its smoothly-worn stone, root, and wind-
throw-
With its barren of loose shifting shale?

Have you fashioned a cup of white birch-bark
To drink from the bubbling spring-
Have you prayed for a swallow of water
Where the dying sparks floated to cling?

Have you battled for life in a blizzard
And fallen exhausted to earth—
Have you kindled a fire 'neath the rock-ledge
Or suffered while death grinned in mirth?

Have you carved with your hand from the forest
A cabin of moss, log, and stone,
And wrested your food from sly nature?
Have you lived for long weeks all alone?

Have you pitted your highly-trained reason
With instinct that God gave the wild?
In the presence of His great creations
Have you felt you were only a child?

Oh, friend, if you haven't lived these things
Do you stand among those of the mass
Who fear meeting life single-handed
Lest they fall 'neath the elements' lash?

Stanley Foss Bartlett.

THE PRACTICE OF FORESTRY ON THE COEUR d'ALENE NATIONAL FOREST

By C. K. McHARG

Forest Supervisor, Coeur d'Alene, Idaho

After about 17 years of forest administration on the Coeur d'Alene National Forest, during which time many fires have burned and many sales of timber have been made, the question naturally arises—"Is forestry being practiced?" The answer is decidedly—"Yes." There are well formulated plans in effect, both for amount and distribution of cut; continuous production is a fact—for it is known what the life of the present mature stands will be—a high standard of slash disposal is carried out, and natural reproduction follows lumbering; and it may be expected that the cut a hundred years from now will be increased over that which is possible at present as a result of a practicable form of regulation.

Resources of the Forest

The Coeur d'Alene National Forest has been very richly endowed. The fires of 1889 and 1910 were a severe setback and unquestionably the allowable annual cut has been reduced, as a result, between 30 million and 40 million board feet. (Just how much can only be approximated for a complete inventory of the losses of those years could not be made.) It is safe to believe that a cut sufficient for one double band mill was lost to the present rotation. In spite of these disastrous years, which stand out above all others, there still remains a fine stand of timber, for this rotation, which fortunately is largely accessible. These two factors, a large volume of readily marketable timber and its accessibility, make intensive forest management possi-

ble and again at Linfor. The Forest is divided thus topographically into four natural divisions: (1) The direct drainage into the Lake and main River, (2) The South Fork Drainage, (3) The Little North Fork Drainage, and (4) The North Fork Drainage. A fifth division is sometimes recognized, the drainage into Hayden Lake, but for all practical purposes this is considered as a part of No. 3. All of these main forks and many of their tributaries of the Coeur d'Alene River are drivable streams. They penetrate to the farther bodies of timber. The bulk of the timber supply lies in the drainages of the North Fork and the Little North Fork. In addition to the drivable streams, railroads extend from Coeur d'Alene Lake to the Montana divide and up the North Fork for nearly 30 miles. While the greatest part of the timber cut has heretofore been transported by water, there is an increasing tendency to use the existing railroads and several extensions are being proposed.

The total stand of merchantable sized timber, all species considered is, in round numbers, four billion feet. This includes all types and stands 60 years old and over. White pine is nearly 40 percent of the total merchantable stand, the other principal species being white fir and hemlock, larch and Douglas fir, cedar, spruce, lodgepole and yellow pine.

The most recent compilation, based on timber surveys up to 1923 and special examinations made by members of the force shows the distribution of age classes as follows:

DISTRIBUTION OF AGE CLASSES

Age Class	0-20	20-40	40-60	60-80	80-100	100-120	120+	All Aged	Total
Acres	174,000	61,000	13,000	54,000	34,000	26,000	189,000	1000	552,000

ble and entirely practicable.

A look at the map will show the accessibility factor. Coeur d'Alene Lake is the center of milling activity for this part of the Inland Empire. The Coeur d'Alene River, entering the Lake from the east, forks at

The gross area of the Forest is approximately 790,000 acres of which about 128,000 acres are alienated. The remaining area of 662,000 acres is National Forest land. The total area of all age classes, as shown above, 552,000 acres leaves a balance of 110,000 acres which

is non-producing. This is divided between barren ground, sub-alpine type, and double burns which must be planted to be productive. This area is not considered at the present as timber producing, though eventually part of it may become so.

Working Circles for Sustained Yield

After establishing the inventory and distribution of the resources the next step has been to consider the question of maintaining industry continuously. The Forest Service has stood by the principle that permanency in industry is fundamental to the nation's welfare. Just how intensively this principle should be applied has been given considerable thought. Three propositions appear possible; (1) to establish a working circle composed of a group of National Forests having a common, logical milling center, in which logging would proceed through the mature timber at a constant rate of cut, though one or more Forests of the group might be without any logging over a period of years. The conception of a working circle is, an area of greater or less extent in which sustained yield and continuous production are maintained, though in individual subdivisions there may be a suspension of activities. (2) To establish a working circle composed of one National Forest only. (3) To subdivide one National Forest into several working circles, based on natural dividing lines, in each of which sustained yield and cutting operations are maintained.

The first does not apply in well developed regions. The second does not satisfy the desires of the Forest Service, since it would permit a concentration of the entire allowable cut in one drainage after the completion of which the drainage might stand for half a rotation period or more with no activity and a consequent loss of logging improvements and a serious reduction in the available fire suppression facilities. The third, applied with reasonable latitude, permits continuous activity in each major Forest division, and, where applicable, fosters the development of permanent or nearly permanent communities.

The last is the one accepted for the Coeur d'Alene National Forest and, while applied broadly, it permits a permanent logging improvement plan in each of the large divisions. Two working circles only are considered, the division being based upon the territory tributary to the major transportation facilities. The drainages of Hayden and Coeur d'Alene Lakes direct, the Little North Fork, that part

of the upper North Fork which is tributary to the proposed logging railroad extending east from Hayden Lake and the main Coeur d'Alene River, constitute one working circle. The other includes the North and South Forks of the Coeur d'Alene River.

With the data at hand covering the volume of timber available, the distribution of age classes and the division of the Forest into working circles, it has been possible to proceed with the formulation of a Forest Management and Cutting Plan. The problem in Forest Management is then, first, to determine a limitation of cut by working circles in the mature age classes which will permit continuous cutting over a sufficient period to bring successively the 100 to 120, the 80 to 100 and the 60 to 80 year age classes to maturity, taking into account at the same time the age classes under 60 years old which should also be brought to maturity without a diminution in the cut; and, second, to so conduct cutting operations that reproduction will follow with certainty with the more productive and valuable species well represented in the new stand and that the added fire risk may be held to a minimum.

Regulation of the Cut

The first part of the problem is not to be solved by the application of European formulae methods. On no extensive area is the available data sufficiently intensive to justify careful mathematics. The mature timber is in virgin stands, which vary in composition and volume on almost every acre. After several attempts to apply formulae without great satisfaction, (though the results were surprisingly good), the method which appeared most consistent with the problem was the very practical and simple one which follows:

For each working circle the area of each age class under 60 years by types was listed. From actual figures of yield per acre and estimates of standing timber, by types, an average volume per acre at maturity was determined. It may be designated as an empirical estimate of volume at maturity. This assumed yield was applied to the age class area list from which computation was derived a conservative estimate of what the younger age classes will produce when the time comes to harvest. It was thus known when and how much timber would be available from the age classes now below merchantable size.

The next step was to list by working circles the known logging chances containing

merchantable timber, giving for each the estimate, the volume deductions for seed trees, etc., and the period of cut at several assumed rates. The rate of cut selected was the one which, when applied first to the present mature timber and next to the successive age classes down to 60 years old, will permit the bridging of the gap between the older and younger age classes. The results of these investigations show that a cut of 20 million feet a year in one working circle and 30 million in the other is justified and these rates may be continued through the present rotation.

Problem of Inferior Species

Because of the low market value of mixed species of timber, a serious difficulty is encountered in the application of a forest management plan. White fir, hemlock, larch and Douglas fir are all more or less difficult to market, except in limited quantities. The Coeur d'Alene mines absorbed some larch and Douglas fir, about 12 million feet being used in the year 1922, but as lumber only limited quantities can be used. White fir is gradually becoming established to a point where it can be handled without great loss. Hemlock is practically unmarketable as lumber. This condition must be taken into account in sales. White fir and hemlock, because of silvical characteristics, are a detriment to the new stand if not removed from the stand when the white pine is logged, their heavy foliage so shading the ground as to prevent the development of white pine seedlings. These species are also frequently very defective in mature stands, which is an added problem in management. Larch and Douglas fir can be left in greater quantities in an area being cut without serious effect.

To meet this problem a careful study covering a number of years was carried on and the policy decided upon as a result appears to have approached a solution. It will be more nearly solved when the major transportation facilities already planned have been established. For the next 20 years, or until market conditions are such that mixed species can be logged at a profit, logging chances will be blocked out on the basis of about 80 per cent white pine and 20 per cent mixed. Where there is insufficient white pine to maintain about this ratio a logging chance will be left intact for cutting at a later period. On large sale areas certain parts, even down to a few acres where the percentage of mixed timber is high, will be blocked out and excluded from

the sale. In other words the practice will be to leave intact all areas which cannot be practicably cut and left in a satisfactory silvicultural condition.

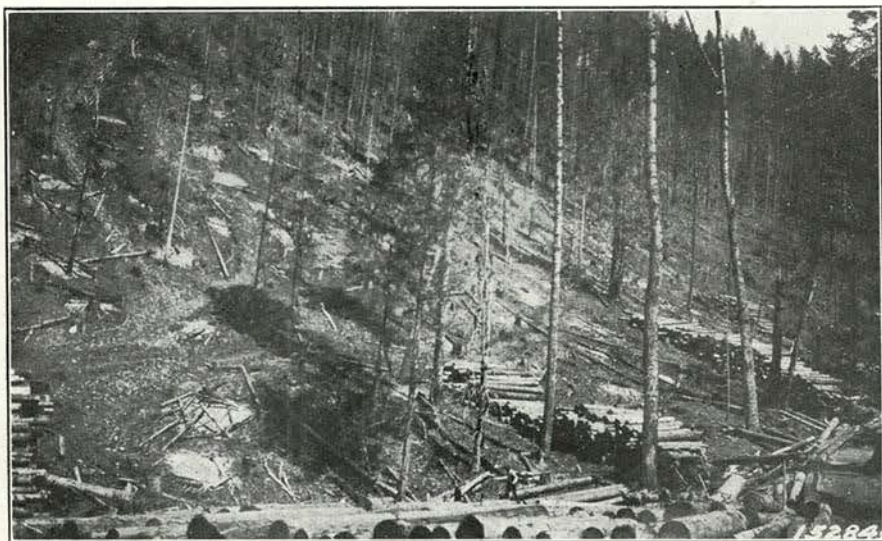
Forest Sanitation

In the over mature stands where the hemlock and white fir are very defective extensive sanitation measures are necessary. These measures must be so applied as to reconcile the factors of fire hazard and suitable conditions for reproduction. Badly defective trees of these species are usually altogether unmerchantable. At the same time they shade the ground to such an extent that white pine seedlings will not develop under them, particularly on the north slopes where they are most common. If these trees are killed by girdling the white pine seedlings develop excellently as shown on areas cut over about 1916 but the fire hazard resulting from these dead trees, each of which produces much inflammable material, might reach a disastrous point. A compromise between these two factors is reached in the latest policy which has recently been decided upon. Defective trees up to about fourteen inches D. B. H. will be felled and the tops and limbs lopped, piled and burned. Trees larger than this figure will be girdled and left standing up to twelve trees per acre. Large trees in excess of twelve per acre will be felled as in the case of the smaller trees. Some variations of this practice will no doubt be followed. Along transportation routes where fire risk is heavy no girdled trees will be left standing and if the aesthetic factor is prominent even defective trees, which frequently are no less beautiful than sound trees, will be left green. In no case will sound and thrifty young trees be destroyed nor will merchantable material be wasted.

The cost of sanitation measures is charged against the present stand of timber even though it is largely for the benefit of the timber in the next rotation. It is part of the obligation to leave cut over areas in the best possible productive condition. At the time of appraisal the cost of this work is estimated as in the case of any logging cost and it is included as a cost of the operation.

Slash Disposal

Since the Coeur d'Alene National Forest has been under administration about 400 million feet of timber have been cut under sales. This cut has been sufficient basis to determine the most effective and practicable methods for the disposal of slash in the white pine type of north Idaho. The object of slash disposal is



A CONTRAST IN SLASH DISPOSAL

Cutting Area in Western White Pine, where slash has been piled and burned—Young trees preserved, fire hazard effectively reduced.



Effect of broadcast burning of Logging Slash in Western White Pine. All living trees killed. The fire hazard will be worse than before the burn in a few years when these trees blow down and weeds come in.

primarily for a reduction of fire hazard after logging. The establishment of a satisfactory new stand of timber is perhaps secondary, though fortunately it is incidental. Without question the system known as "piling and burning" is most effective in attaining the object. That it is practicable is proved by the fact that the high Forest Service Standard costs now only about 3 1-2 percent of the value of white pine logs delivered in driving water.

Slash piling is carried on during all seasons of the year, except in the period of heavy snow, or from about December 1 to April 15. All material up to 4 inches in diameter is piled in compact piles well separated from each other. Normally from 20 to 25 percent of the ground area is covered by slash piles. The foreman ordinarily drives a long stake to mark the location of piles. The laborers then pile the slash around the stake. The difficulties on steep ground will easily be recognized. The piles average perhaps 4 to 8 feet in diameter and 3 to 5 feet in height.

Slash burning must be accomplished within a very limited period. Rarely indeed will the slash burn until the snow goes, which is usually in April. All burning must be stopped by June 1, since "hang overs" will be apt to occur later, causing fires. The fall burning cannot be started until the seasonal rains occur, usually the second week in September. The period extends to about November 15, when the moisture conditions make burning very expensive. In the average year the burning period amounts to a total of about 3 1-2 months, little enough time to burn the slash from 50 million feet. This period is frequently shortened by an October too dry to burn safely or too wet to burn at all.

Modifications of this system are carried on at times. "Progressive burning" is used to advantage in some cases. This process is simply one of starting a series of fires during the wet season and piling the green slash directly on the fire. In some overmature stands, which have been cut clean, a controlled broadcast burn is used. Here the slash is handled only enough to separate the windrows and burned. This is practiced only on flats and to a very limited extent. It is not used where any young timber is left.

The costs of piling and burning slash vary,

of course, with the wage scale. Current costs are in the neighborhood of 85c per M on the timber cut.

The results of continued piling and burning cannot be questioned. The fire risk is greater of course than in an uncut timber stand, but it is reduced to a point where it is possible to successfully fight a fire once started. It is interesting to look down from a high point overlooking a sale area which has been logged and the slash piled and burned. Unless the eye is experienced it is difficult to detect that any timber has been removed.

Planting

This brief sketch of how forestry is being practiced in a north Idaho National Forest is perhaps not complete without a statement concerning artificial reforestation. Ordinarily, the operation of cutting is followed by natural reproduction. However, some tracts which have been visited by disastrous fires two or more times do not come back to a forest type, or the return will necessarily be so delayed that planting is justified. Where the 1910 fires burned in very young stands and in some cases in very old stands, natural reproduction has not followed. In some other places the 1910 burn was reburned in 1919 and here also the new forest has not started. Plantations have been started on an extensive scale to bring back the land to a producing state. It is planned to plant the non-producing white pine type within about 20 years. At the present time a project of about 14,000 acres is under way on the east fork of the Coeur d'Alene River near the Montana divide. Large areas near Wallace have already been planted since 1912. The results of planting are on the whole satisfactory, though there have been certain failures due to the long dry summers of recent years, which the young seedlings could not withstand. Some plantations show as high as 85 per cent survival. On the whole the average indicated that about 100 planted trees per acre have survived.

That forestry is possible as a governmental or other public project in America, is a fact. The Coeur d'Alene National Forest is now paying its way. Even permitting the permanent improvement expenditures to be charged as costs the returns in actual funds are in excess of the costs.

PUBLIC RELATIONS IN FORESTRY

By THEODORE SHOEMAKER

In charge of Public Relations, U. S. Forest Service, Missoula, Mont.

Success in any large undertaking depends on public opinion. Opinion can only come from knowledge and knowledge from interest. A large part of the people of the United States are not interested in Forestry. They therefore have little knowledge of it or its importance and give it practically no support. Yet forestry is a large undertaking and concerns everybody. In order to succeed it must have a public sentiment that is both general and favorable.

In thus stating the case it is not my purpose to cry "Wolf, Wolf!", but only to face the issue and admit the facts as they are. The situation might be better, and it might be a great deal worse. When all the facts are boiled down the one big fact that stands out is that while considerable progress has been made in building up public sentiment it has been too slow. The pressure for improved practices in the protection and cutting of our forests has not been strong enough, and as a result those practices have not grown fast enough to prevent a serious timber shortage. Already this shortage is keenly felt in many regions where timber was once plentiful, and if we keep on our present course it is but a question of time till it will be felt nationally.

That the federal government has foreseen the danger and has created the National Forests, which it is managing on a permanent basis does not solve the problem, as so many people think it does, because the National Forests, even under the best of management, are capable of producing but a small part of the timber needs of the country. Besides, even on the National Forests, fire control and reforestation are still not on an entirely adequate basis, due to lack of funds. Congress has been slow to increase appropriations or to add more timberlands to the National Forests, showing the lack of a general understanding of the need for it. The States are not doing as much on the whole, compared to the importance of the question, as they should. Private owners are generally either indifferent or else, because of risks, taxation and other burdens, are unable to handle their timber lands with regard to future production. With some exceptions they have not even adopted methods that will insure any kind

of a stand after cutting. In a word the public is dormant on the forest question,

The task of foresters is nothing more nor less than to make the forests of the country continue to supply our needs for forest products. We must speed up if we are going to accomplish that task. It is not enough that we learn technical forestry, so that we can simply do our jobs in handling the public forests or in private employ. We must take up as well a part in building a public sentiment that will make forestry on an adequate scale possible. It is no use to prepare ourselves in a profession or trade in which there is no demand for our services. The Government and the States can not hire foresters unless the Congress and the legislatures appropriate money for that purpose. That will not be done except under pressure of public sentiment.

Let us look the question squarely in the face. Whose business is it that our forests are being destroyed, and who is responsible for bringing about a condition of the public mind that will correct those tendencies and practices that are so rapidly bringing about forest depletion? Everything depends on honest answers to these questions. It is the point of beginning, and until we find those answers we shall not even be able to marshal our forces and set about intelligently the accomplishment of that job. That is what I mean by facing the issue.

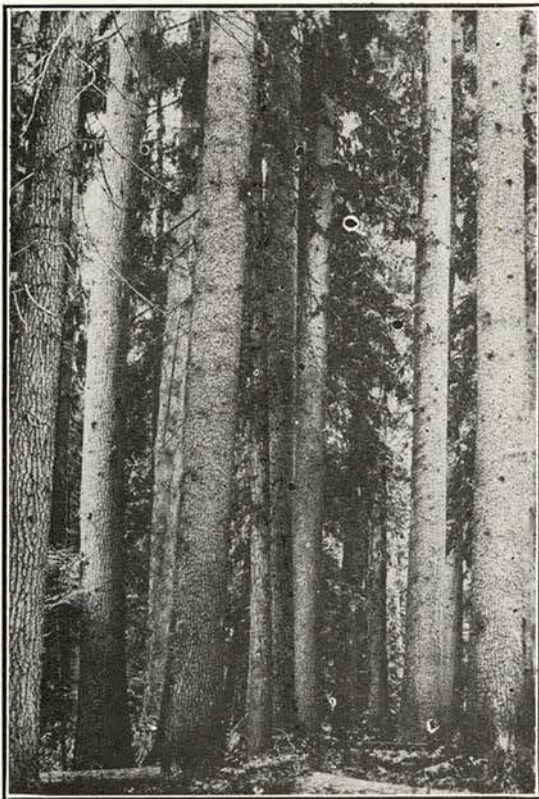
The answer to the first question is that it is everybody's business, which so often is equivalent to saying it is nobody's business. What happens to our forests concerns every individual citizen. This must be understood. Belief in this fact and willingness to launch out on it are fundamental qualifications of the man who would try to interest the public in forestry. How can we hope to interest people in what does not concern their welfare? It cannot be done. Scarcity of timber affects the price of rent and of almost every item of food or clothing. Once the public is made to see it in that light we shall have their interest, and an adequate forest policy will spring into existence.

In answer to the second question, there may be some disagreement as to who is respon-

sible for bringing about a state of the public mind that will correct our forestry wrongdoings. Here again, and particularly, let us be honest and fearless in our answer. It may help if we consider who, indeed, can interest and instruct the public in matters pertaining to forests. Viewed in this light it seems to me the answer becomes obvious. Only those who know can teach. Any person who does not see what forests mean to individual and community welfare cannot hope to show it to others. If he does see it, and if he does

countability I suggest you have only to ask yourself whether you are among those who understand the forest problem. If you do not understand and are employed as a forester it is your duty to learn. Surely that will be conceded, for no one can be a true forester who does not teach it.

In order to be a little more specific, let us list those classes of individuals having knowledge of what forests mean. They are (1) foresters; (2) forestry employees who are not trained foresters; (3) instructors of for-



Mature Western White Pine Timber

recognize that public sentiment is necessary, he cannot well dodge his responsibility. On whom, then, does this place the duty of building public sentiment? On foresters. In saying this I use the term in its broadest sense to include not only technical foresters and men of the State and Federal Forest Service, but all who know our forestry needs regardless of what line of training, experience or business that knowledge has reached them through.

As a measure for determining personal ac-

estry; (4) teachers; (5) editors, journalists and authors; (6) members of sportmen's and other outdoor clubs; (7) timber land owners; (8) users of forest resources; (9) naturalists, scientists, economists, etc.; (10) County, State and Federal officers; (11) other interested and informed persons.

That is quite an imposing list, but it must be remembered that not all are working at the problem. Not all trained foresters even may be depended on. The same is true of members of the Forest Service, some are

actually doing very little because they do not see this side of their jobs. I doubt whether this phase of forestry is stressed as much as it should be in the forest schools of the country, indeed, whether there are not some instructors who have not thought of teaching it as they teach silvics and mensuration. Certainly it is not as well understood as it should be by teachers of agriculture, geography, civics, economics, and other subjects to which forestry bears such close relation. Comparatively few of the newspaper and magazine editors and journalists of the country see it as something they should give active support to. The same applies to naturalists, scientists, economists and teachers. Timberland owners, outdoor people and recreationists are more alert and active because they are more directly dependent on forests for the things they are doing. Here and there also are individuals without regard to business or professional interest, persons of ability and influence, who have become deeply interested and are doing a great deal. They are persons of vision, who see and understand the meaning of forest depletion, and who, with fine public spirit, are assuming the duty of telling others.

Taking it all in all our forces are widely scattered, variously trained and loosely organized. Leadership and co-ordination of effort are needed, but under that leadership and co-ordination there must be a thorough individual knowledge of the importance of the problem, and a deep sense of individual responsibility for helping to solve it. That is the great need.

From any standpoint it seems to me public relations work should begin at home. We need to sell forestry to foresters and to those whose business is directly connected with the things of the forest, and we need to sell it to them in a way that will start them out to sell it to the general public, which, though not so patently, is nevertheless vitally concerned.

Now if it be admitted that what happens to our forests concerns everybody, and that those who understand the problem are responsible for creating the public sentiment necessary to save the situation, and if it be further admitted that our present course is wrong, then we are ready to consider what should be done, and how to go about it. If the forests are to be kept sufficiently productive we must stop doing some of the things we have been doing and we must begin doing some other things we have not been doing.

Also some of the things we have been trying to do must be done more effectively. Most of these things can be included under a few main heads as follows:

- (1) Better results in fire prevention.
- (2) Determination of permanent forest lands and the adoption of methods of cutting and logging that will keep them productive.
- (3) Stop waste in the cutting and manufacture of timber.
- (4) Increase the utility of wood thru preservative treatment and thru the application of scientific knowledge of its characteristics and fitness for various uses.
- (5) Reforestation and afforestation of waste land suitable for timber growing.

The accomplishment of these things is to a considerable extent a matter of extending operations that are already in use, but in other cases it means quitting certain things and taking up new ones. It would be interesting to consider these real forest problems in detail, but that does not properly come under this discussion. It will be pertinent to say, however, that the solution thru research and scientific investigation by which the public can be shown what is wrong and how it can be righted is of the very greatest value in Public Relations work.

In considering the means at our disposal for interesting the public, we should remember that these things have already been quite largely determined by much research and demonstration work, and the results constitute the best kind of materials and arguments to use. For example, the principles underlying fire control and the necessary machinery are pretty well known; the same is true of the reforestation work, management of cutting, etc. Perfections in these methods will come with their application on an extensive scale, of course, still they are now ready for use, and their extensive use would cure our forest ailments. But before they can be used they must be sold, and here is the crux of the problem. We have been growing or manufacturing some fine goods, but we still have too much of them on hand. Our salesmanship has not kept pace with our plant production. We have a product the public needs but we have neither convinced them they need it nor proved to them that the goods are right. Salesmanship! That is the public relations side of forestry, and I have come to consider it of equal importance to all the

steps in manufacture put together. We feel that our goods are right and that is the best kind of foundation for selling arguments, but we must also have a selling organization and we must put punch and system into our methods.

Two ways are open. One is thru education to secure voluntary adoption of good forestry practice. The other is thru the enactment and enforcement of laws to require it. The latter must come thru education also. A good deal has been done by the former method, and certainly as much as possible ought to

But there are differences which in some measure handicap our efforts. One of these is the long-time nature of the problem. If we build a road we can start right in using it, if we buy better dairy cows there is immediate return in the cream check, or if we put fertilizer on the soil it reflects benefit in this year's crop, but if we plant a tract to timber or invest money in saving a patch of seedlings from fire the benefits are much farther removed and much less tangible. To me this seems a real obstacle and one that requires our best thought to remove. If a man tried



Fire Burning at Night in a North Idaho Forest

be done that way. No opportunity should be lost to show owners of timber how to make good forest management pay. It would pay in many places where owners do not now see it. But even at best much will be left to law enforcement, involving assumption of costs, at least in part, by Government. The same principle holds here for it involves taxation, and people will not tax themselves for forest protection unless they can see that it will pay. That is why they build roads and schools, cultivate their land more intensively, or breed better stock, and that is why they will take up an adequate forest policy some time.

to sell you a house or an automobile and required that you wait five years before using it you would think him crazy. So he would be, for there would be no reason in such a requirement. There is reason for investing in forestry even tho the benefits are deferred, but all the same I think we must try to tie them in to the present generation closer than we have done, and show up more clearly the immediate benefits. School children can readily be interested in what the forests will be in the future, for their faces are turned that way, but the adult lives in the present and wants present rewards. One of the best ways to show immediate returns is to have them

see that their children's welfare is at stake.

Another difference is in organization. We cannot organize our selling department as a commercial house would do. In the first place, we would have no support for a policy that would build up a strong special selling organization, and in the second place, our customers are so widely scattered that centralized salesmanship is not practicable. We are both wholesalers and retailers. The man who makes or uses forestry must sell it in his own territory—to his own customers.

The selling organization proper, which is the branch of public relations, is therefore small, and its function is simply to devise ways and means, and to direct and supervise the selling activity. It should plan and lead, and help where help is most needed. Its first task, as I see it, is to build up among foresters a conception of their jobs that includes selling as well as producing, and that gets them to accept their responsibility for this part of the work the same as for any other part.

It seems to me that a clear-cut and comprehensive conception of the situation from a national standpoint is what we need to have foresters get in order that they may see the value of public relations work and their duty in respect to it. Because forests, regardless of location are of importance nationally as well as locally. Lumber is now crossing the continent by rail or going around from the western coast to the eastern by water, and it may have to go the other way some time. In the shortage which is ahead of us, location will be of little importance. What will count

is the fact that there is or is not timber where it could have been grown.

If I were asked to outline in a few words such a conception, I would put it about this way: Something is wrong in our forests. It concerns everybody, but most of the people don't know it, or at least don't know what ought to be done about it. It can be remedied only thru education that will secure the interest and support of the whole people. It is high time the work of building up this sentiment is pushed if the serious effects of forest depletion are to be avoided. Those who know the condition must assume the task of educating others. The consequences of inaction are in the future, or else lack tangibility and close relation to the present, making it more difficult to secure interest. Progress is bound to be slow, and will require years of steady hammering away.

But we are well thru the experimental stage in forestry practice and have reached the stage where our job is to get these practices generally adopted. Having developed our product, forestry, and having worked out the details of its manufacture to at least, a point of practical success, we are ready to start on quantity production and take our profits. We have reached the place where advertising and selling are the things that govern success. Let every forester turn part salesman, let him work at that side of his job as studiously and faithfully as he has worked at the other and the business he has invested in will grow and prosper until it becomes a nation wide public utility benefitting every individual citizen.

DAY DREAM

The west wind dances in your hair
 And fans your blushing face
 It plays tag with your shifting plans
 And dreams that run a race.
 You feast your eyes with peaks and trees
 Your soul with birds' gay song
 You cannot keep your wand'ring thots
 The place where they belong.
 You fill your chest with the good clean air
 And your mind with things you love,
 You stretch your arms to the heavens blue
 And know that God's above.
 Your muscles swell beyond control
 Your courage unsurpassed
 But suddenly you're lonesome
 And back to earth you're dashed.

Stanley Foss Bartlett.

THE FORESTRY SITUATION IN NORTH IDAHO

By F. G. MILLER, Dean

For want of adequate laws to prevent it, the state of Idaho is rapidly nearing the days of a waning lumber industry. Action has already been too long delayed by 25 years, for in spite of any remedial measures that may be taken now, lean years are inevitable, and the best that can be done is to mitigate them. Every year's delay is piling up huge losses from fire, and jeopardizing the future of the whole forestry enterprise. These losses are by no means confined to merchantable timber. In fact, as far as the future of forest industries is concerned, the greatest losses are sustained in the destruction of young growth on cut-over lands; and these are accumulating in the state at large at the rate of 40,000 to 50,000 acres per year. The blame rests with the general public since three-fourths of the fires are man caused, hence preventable. Moreover, the people have it in their power to enact into law the measures necessary to control the situation.

Example of Michigan

Idaho is so dependent upon her three primary sources of wealth—agriculture, forestry and mining that she cannot sacrifice any one of these even in part without serious economic results. Michigan may be cited as an example of a state which needlessly sacrificed her lumber industry. Had the state properly handled her forest wealth, she could today not only supply her home needs, but could have an excess for other markets. As a matter of fact Michigan is paying an annual freight bill of several million dollars on lumber shipped in from distant lumber centers.

But Michigan could far better withstand the sacrifice of her lumber industry than Idaho can, because the former has other important manufacturing interests, and is near the center of population hence has nearby markets for agricultural products. Idaho, on the other hand cannot hope to rival Michigan in manufacturing enterprises outside of the lumber business, and the state has a handicap of a 2000 mile longer freight haul in finding markets for excess farm products.

Professor Russel Watson of the University of Michigan is authority for the statement that it will cost Michigan one hundred million dollars to reforest her deforested, non-agricultural

lands, besides three million dollars a year for 70 years to maintain these new forests once they are planted. These investments at 3½ per cent compound interest for 70 years will amount to about two billion dollars. Meantime, the state will pay from five to ten millions a year more for wood products, due to increased freight rates and advances in wood than she would need to if she grew these products at home. This, Prof. Watson adds, is the price the state will pay for not handling her original forests in a rational manner.

Area, Stand and Cut by Ownership in North Idaho

The land area north of the Salmon River comprises around 12½ million acres. Of this nearly 2¼ million acres are in farms, about 9⅓ million acres are classed as forest lands, including cut-over and burned-over areas, and the rest is grazing and waste lands.

Of the forest lands, according to an unpublished paper entitled "Public Requirements Report for District 2" by the U. S. Forest Service, the government owns 6,471,000 acres, or about 69 per cent, 2,350,000 or 25 per cent is privately owned, and the state controls 528,000 acres or slightly less than 6 per cent. This ownership is shown by the accompanying diagram.

Further reference to this diagram shows a very different situation as regards the ownership of the standing timber. North Idaho is credited with 60 billion board feet of merchantable timber, of which the government owns 24 billion feet, or 60 percent; 29 billion feet or 48 per cent is in private ownership, and 7 billion feet or nearly 12 per cent is held by the state. Thus it will be seen that while only about 25 percent of the forest area is owned privately, 48 percent of the timber is so owned.

In a paper, entitled "National Forests of Northern Idaho" by Mr. Fred Morrell, published in *The Timberman* for January, 1923, the lumber cut for north Idaho in 1922 is given as 800 million feet. The most striking discrepancy revealed by the diagram is the ownership of the 1922 cut, for while slightly less than half the standing timber is in private

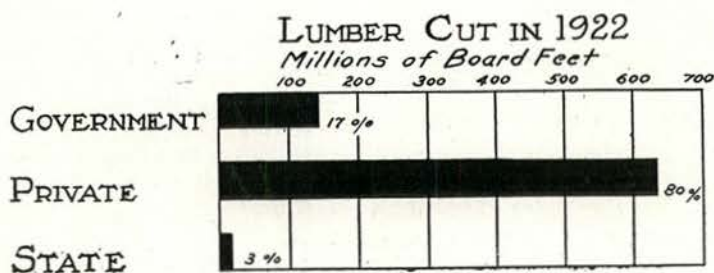
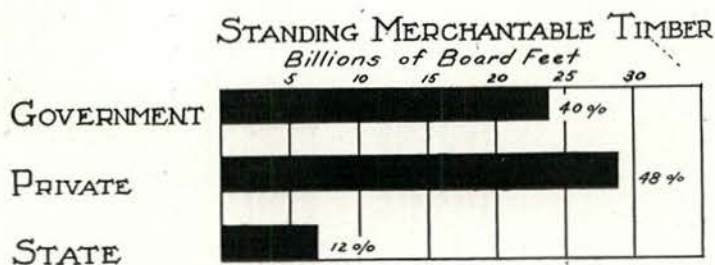
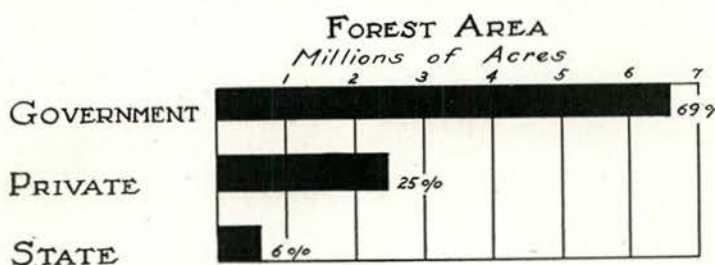
ownership, private owners supplied 80 percent of the cut, as against 17 percent by the government, and about 3 percent by the state.

How Long Will the Timber Last?

It is the settled policy of the Forest Service to cut its timber on the basis of a sustained annual yield by national forests and subdivisions of these forests, hence the government will be able to furnish a continuous supply. The state also plans to dole her timber out

in the older lumber regions, and the consequent shift of the lumber business to the west, the cut in North Idaho will increase rapidly in the near future, so that the great body of privately owned timber will disappear in the next 25 or 30 years. The government and state forests together cannot supply on a sustained yield basis to exceed one half of the cut in 1922, hence a disastrous slump in the lumber output is inevitable.

NORTH IDAHO



gradually so as to assist in prolonging the life of the lumber industry. But the privately owned timber is not being handled with reference to a sustained yield, and will, therefore, be cut out as soon as practicable. The private cut in 1922 was 640 million feet, and since the amount of standing timber owned privately is 29 billion feet it would last at this rate of cutting about 45 years.

But with the growing shortage of timber

The slump will be more serious by regions than for north Idaho as a whole. For example, the bulk of the cut now is from a limited territory tributary to Spokane, and the privately owned timber here will go first. Meanwhile the industry will shift to the Clearwater region, a movement which is already taking place. Towns now in the Clearwater territory will see rapid growth, new communities will spring up, and the whole region will pros-

per for a time, only to suffer the same fate as the territory tributary to Spokane when the privately owned timber is gone.

Here is a concrete example of the need of constructive measures to regulate the time, place and rate of cutting. Obviously, even if the timber lands are kept in continuous forest crop by adequate fire protection and proper silvicultural measures, stability of the lumber industry in any given community can come only when the annual cut in that community is restricted to the annual growth. If the territory tributary to Spokane were to go on this basis, it would have to restrict its annual cut to less than one-third of what it is now cutting, while the Clearwater country could increase its cut to several times its present volume. Thus if all the forest land could be kept growing timber to capacity, there would not be any serious reduction in population or number of mills for North Idaho as a whole, but a redistribution of both, and the towns and industries dependent upon the lumber business once adjusted to the new conditions would be stabilized and made permanent. However, regulatory measures to bring about such a condition are impractical at present, but something to work toward in the future.

Meanwhile let it be repeated that it is most fortunate that we have these great national forests which are being managed with reference to permanency in all districts. It is fortunate also that the state is managing her timber holdings with a view to stabilizing the lumber business by selling her timber gradually, rather than as rapidly as opportunity offers. Both the government and the state should husband their timber resources against the time when the slump is upon us.

Slow Demand for Logged-Off Land

The impression prevails in some quarters that the economic loss resulting from the decline of the lumber industry a few years hence will be offset by converting logged-off lands into farms, but facts at hand do not support this idea. In the first place only a limited portion of the forest area has agricultural value. The 69 percent of the forest area in government ownership is practically all non-agricultural. The bulk of additional agricultural land, therefore, will have to come from the state and privately owned forest areas. The best available information at hand would indicate that all told probably not more than a million acres of additional agricultural

land can be developed out of the forest areas in North Idaho.

Of the $2\frac{1}{4}$ million acres of farm land, about one million acres are improved. It is of interest to note that nearly 89 percent of the improved farm land is found in Latah, Lewis, Nez Perce and Idaho counties, which means that it has been converted not from logged-off land, but from the prairies. A considerable part of the other 11 percent is found along the river and creek bottoms or originally existed as natural meadows within the forest belts. Hence it is that a small percentage of the actually improved farm land has been converted from cut-over land.

Development of the agricultural logged-off lands should be given every encouragement possible and some headway in clearing is being made in restricted localities here and there. But the fact remains that as a whole logged-off land is being developed extremely slowly. Even when clearly agricultural in character and near railroad transportation, it is awaiting settlement and development. All such land should be kept at work growing timber till it is actually needed for agricultural purposes, although this is far from the case.

A Million Acres of Idle Land

Data recently compiled for North Idaho from the county assessment records show about 1,800,000 of cut-over and burned-over lands. Field notes indicate that not over 40 percent of this area is restocking to a degree which would be even passably satisfactory. If this be true, then north Idaho has not less than one million acres of devastated or semi-devastated forest land, on the tax rolls, the greater part of it comprising our finest white pine lands. Some of these lands have a limited value for grazing purposes, but for the most part they are tramp lands, and represent just so much economic waste. If they had been kept in continuous forest production they would be growing annually at least one hundred million feet, or one eighth of the timber cut in 1922.

Wood Industries Seek to Locate in Idaho

As the supply of timber gives out in the older timber centers the secondary wood using industries seek new centers of supplies, and move hither. Many such industries now have their representatives in the west including Idaho scouting for new locations. A few have already located here. Among these, the Diamond Match Company, the Ohio Match Company and the Inland Empire Paper Company may be cited. The latter's mill is

located at Millwood, Washington, but it draws mostly upon Idaho for its raw material. But many secondary wood using concerns are loath to move to a new location unless they can have assurance of a permanent supply of wood. If Idaho could keep all her forest lands in permanent forest production, the number of wood manufacturing concerns which would locate here would in the aggregate support a formidable pay roll.

Remedial Measures

To keep the logged-off lands continuously covered with growing timber is the most important forestry problem the state has to face. It is not the work alone for the owners of these lands. Timber regardless of ownership to an unusual degree is a community asset, and the burden of growing it is therefore a community responsibility.

Owing to the lack of space, only a few of the essentials of a State Forest policy are here suggested:

1. The first of these is the creation of a state department of forestry presided over by a state forester.

2. A second essential should provide for a more rational disposal of slash resulting from logging operations. Under the Fallon fire law enacted in 1907, the general custom has been to broadcast burn the slash, if any disposal was made at all, a method which not only destroys all young growth below merchantable size, but one which in stands where such growth exists after the merchantable timber is removed, does not reduce the fire hazard.

It is conceded that in the mature or over-ripe white pine stands, where little or nothing in the way of tree growth is left after the merchantable timber is cut, broadcast burning of the slash may be permissible. But in stands where after logging, advanced growth is left, which might become the foundation of a new crop, broadcast burning is wholly wrong. Over large areas in the white pine type, trees left would furnish a second cut by the time the present merchantable supply is gone, and would thus serve to prolong the life of the mills now in operation.

As applied to the white pine type, the Fallon law should be so amended as to provide that the slash incident to logging shall be piled and burned, unless otherwise ordered by the state forester.

3. A third essential would seek adequate protection both for all merchantable timber and all cut-over lands, the expense to be shared by all owners on an equitable basis aided by federal and state funds. At present a considerable percentage of the merchantable timber as well as of cut-over lands is riding free.

A large part of the cut-over lands in north Idaho is within organized fire districts, where it receives some, though not adequate protection. A still larger part is in unorganized territory and receives no protection whatever. As stated above in spite of these conditions, possibly 40 percent of the cut-over lands in this section is reproducing to growing timber, and much more of it would restock if given a chance.

In this connection, it is of interest to note the following resolution adopted at a recent meeting of the Standardization Committee of the Western Forestry and Conservation Association, representing lumber interests, federal, state and private, in Idaho, Montana, Washington, Oregon and California.

"Resolved that we favor giving cut-over and burned-over lands and areas restocking with young growth, adequate protection against forest fires, and to this end endorse a policy whereby owners of such land contribute for their protection on some reasonable basis, which contribution should be supplemented by substantial federal and state aid."

This plan of cooperation in part is now in effect in Idaho but it needs to be extended with greatly intensified efficiency to cover all logged-off areas.

Other amendments to the present law and new sections will be necessary if the situation is to be fully met. If from the beginning of timber operations, Idaho's forest lands could have been restocked as logging progressed and kept producing to capacity, the lumber industry could be maintained permanently in its present magnitude, if indeed it could not be substantially increased.

THE INTRODUCTION OF LOG LOWERING SYSTEMS IN THE INLAND EMPIRE

By THOMAS B. JACKSON, '19, Logging Engineer

Within recent years log transportation has become more and more a railroad proposition and as the logging operations have moved into steeper country, logging railroading has developed quite differently from ordinary railroading. One new development in steep railroading is what is called the "incline" or log lowering system. The loggers developed special geared locomotives and put on extra braking equipment for steep grades but these only served for grades up to ten or twelve per cent. The incline or log lowering system has permitted the handling of logs on almost any grade. The first and simplest type of log lowering system was merely a logging donkey used to lower cars of logs with a line. This worked very well for straight pitches that were not too steep, but for curves and steep grades, say above thirty per cent, other difficulties were encountered. In order to keep the cable from bending and wearing on the curves, several different kinds of rollers have been used. With the increased popularity of the lowering system, different logging equipment companies have been building lowering engines with powerful brakes and special safety devices to better fill the needs of this class of service. Another difficulty encountered in steep grades is in keeping the logs from sliding off the cars. This is overcome by putting a choker around the load and lowering by this choker.

One of the chief advantages of an incline is that the roadbed can be of cheap construction. It can follow the contour of the ground, breaking from one gradient to another as long as it is steeper than six or eight per cent. Another surprising thing is that the track can be of much lighter construction than that for an ordinary railroad due to the absence of the driving action of the locomotive.

There are two distinct types of lowering systems in quite common use, the simple or straight lowering and the balanced type. The former consists of a special donkey engine which lowers and raises the car with a single line. In the latter, the line takes three or four wraps around a gypsy or endless drum, a car is attached to each end of the line and one car is lowered while the other is being

hauled up, thus utilizing the force of gravity to save power and fuel.

A variation of the simple lowering system which has proven quite successful on grades under thirty per cent has been developed by Mr. E. B. Sessoms of the Ebey Logging Co., at Arlington, Washington. It consists of a car, which Mr. Sessoms has patented, upon which are fastened huge blocks. One end of the lowering line is made fast at the head of the incline, the other works on the drum of the engine, and the bight of the line works thru the blocks on the car. The cars to be raised and lowered are coupled to the lower end of this special car. A detailed description of this system can be found in "The Timberman," for August 1921. Through a system of rollers and hangers, Mr. Sessoms has eliminated much of the wear on the line and claims three or four times the average length of life for his lowering line.

The big cost in the operation of a steep incline is wire rope, and then come labor and fuel. The life of an inch and a half line on the average lowering system is comparatively short, depending of course upon the character of the installation, the amount of curvature, the grades, and the care given to the line. On one operation in the Puget Sound district, which has practically no curvature but grades up to 60 per cent, they have averaged eleven million feet with an inch and half line. On another one near there, where the grades run up to 35 per cent, they averaged twenty three million feet. Mr. Sessoms on one of his operations, lowered 150 million over a grade of 23 per cent with one line.

Crude oil seems to be the popular fuel for these machines for the sake not of economy only, but also because of ease in operation and safety from fire. Due to the length of an operation, wood would have to be transported some distance which would not only be costly but would interfere with the rest of the operation.

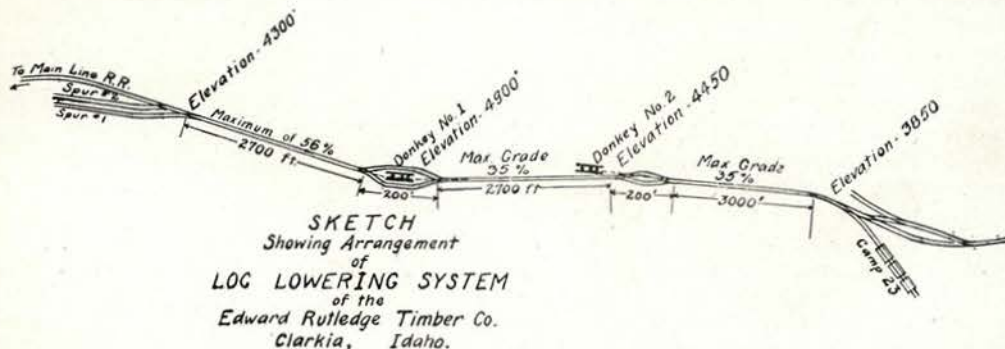
Lowering systems in some form have been used on the coast for several years. It is, however, only in late years, since the logging operations have moved into the rough country, that they have become popular. The

first one to be used in the Inland Empire has recently been installed by the Edward Rutledge Timber Company, near Clarkia, Idaho. The company had about ten miles of railroad located with which it was planned to tap their Bussell Creek timber. This timber had to come out over a divide and most of this ten miles of survey wound around through the mountains to get a reasonable grade, part of it being "dead" line, i. e., running through land on which there was no merchantable timber. In the fall of 1921, the company's engineer conceived the idea of putting in a lowering system to haul the logs over the divide in order to save building this ten miles of expensive railroad and that winter he ran the necessary surveys and planned the system in detail.

In the summer of 1922 a severe fire burned over quite an area of the Bussell Creek timber and scarcely was the fire under control when the company decided to install the incline. Clearing and construction were begun

The cars are then pulled one by one about half way up the hill by engine No. 2. No. 2 is the simple type of lowering engine, the line winds up on the drum as the load is raised. Engine No. 1, placed on top of the main divide, takes the car of logs where No. 2 leaves it and hauls it the rest of the way up the hill, at the same time lowering a car of logs down the other side of the mountain. This is the balance type of operation. The line takes four or five turns around a gypsy drum on the donkey and a car going down is always helping to pull a car up on the opposite side, of the hill. When one car of logs arrives at the top of the divide and the other car at the bottom on the main railroad side, an empty car is fastened to each end of the line, the engine is reversed and the empty going down helps pull another empty up the hill.

Engine No. 1 sits in the center of a level passing track one hundred and fifty feet in length. A small two drum auxiliary engine deriving its steam from the main engine boiler



immediately and a logging equipment engineer arrived, looked over the ground, and sold the company a couple of lowering engines. The first engine arrived in September and was immediately assembled and moved to the top of the divide under its own power. The second engine came in October and was pulled over the divide by engine No. 1, while still on the car. A set of camp cars were moved over during the first part of December and a couple of locomotives and a loader by the middle of the month. The first load of logs was loaded and sent back over on the 21st of December.

The Rutledge lowering system is in reality two different systems working in unison. The logs are loaded at Camp 23 or below and brought by locomotive to the foot of the incline as indicated on the accompanying sketch.

is used to pull the cars from one end of the passing track to the other. Spur No. 1 on the main railroad side with a capacity of 15 cars, has a drop of one per cent toward the incline. A locomotive places a string of empties upon it and they can then be dropped by hand as needed to where they can be made fast to the end of the line. Spur No. 2 has a drop of one per cent away from the incline and the loads can be dropped out of the way by hand until a locomotive hauls them away. A gravity flow of water was obtained for No. 2 but from there the water had to be pumped by steam to No. 1. At present engine No. 1 burns oil and No. 2 wood. Oil burning equipment will be installed in No. 2 as soon as the wood in its immediate vicinity is used. At the time of writing the capacity of the installation has not been tested but is estimated that it will

handle from twenty to thirty cars in eight hours.

If this installation proves as successful as it promises to be, there is no doubt that in-

clines will play a prominent part in the future moving of logs out of the rough mountains of the Inland Empire, which are almost inaccessible by ordinary logging railroad grades.

THE PRESENT STATUS OF WHITE PINE BLISTER RUST IN THE WEST WITH SPECIAL REFERENCE TO THE WHITE PINE IN THE STATE OF IDAHO

By HENRY SCHMITZ

Associate Professor of Forest Products and Agent, Office of White Pine Blister Rust Control, U. S. D. A.

It is a fact that the forests of Idaho constitute one of the state's most important resources. Furthermore, it is also a fact that under the existing economic conditions the State of Idaho cannot have any marked degree of prosperity without the lumber industry. It is imperative, therefore, particularly from the standpoint of the future that the forests should be perpetuated. Three factors militate against perpetuating the forests, namely, destructive logging, fire and disease. In many respects destructive logging is of the least importance since it can easily be controlled and the state and community profit at least temporarily by utilization of the forest crop. In the case of both fire and disease, no one profits even temporarily. Moreover, both necessitate the expenditure of considerable money if they are to be controlled. Of the two, fire and disease, disease is in many respects the harder to control. The above statement should not be interpreted as a defense for destructive lumbering. The only purpose in making the statement is to substantiate the contention that of the three destructive factors, disease is at least equally as important as any other.

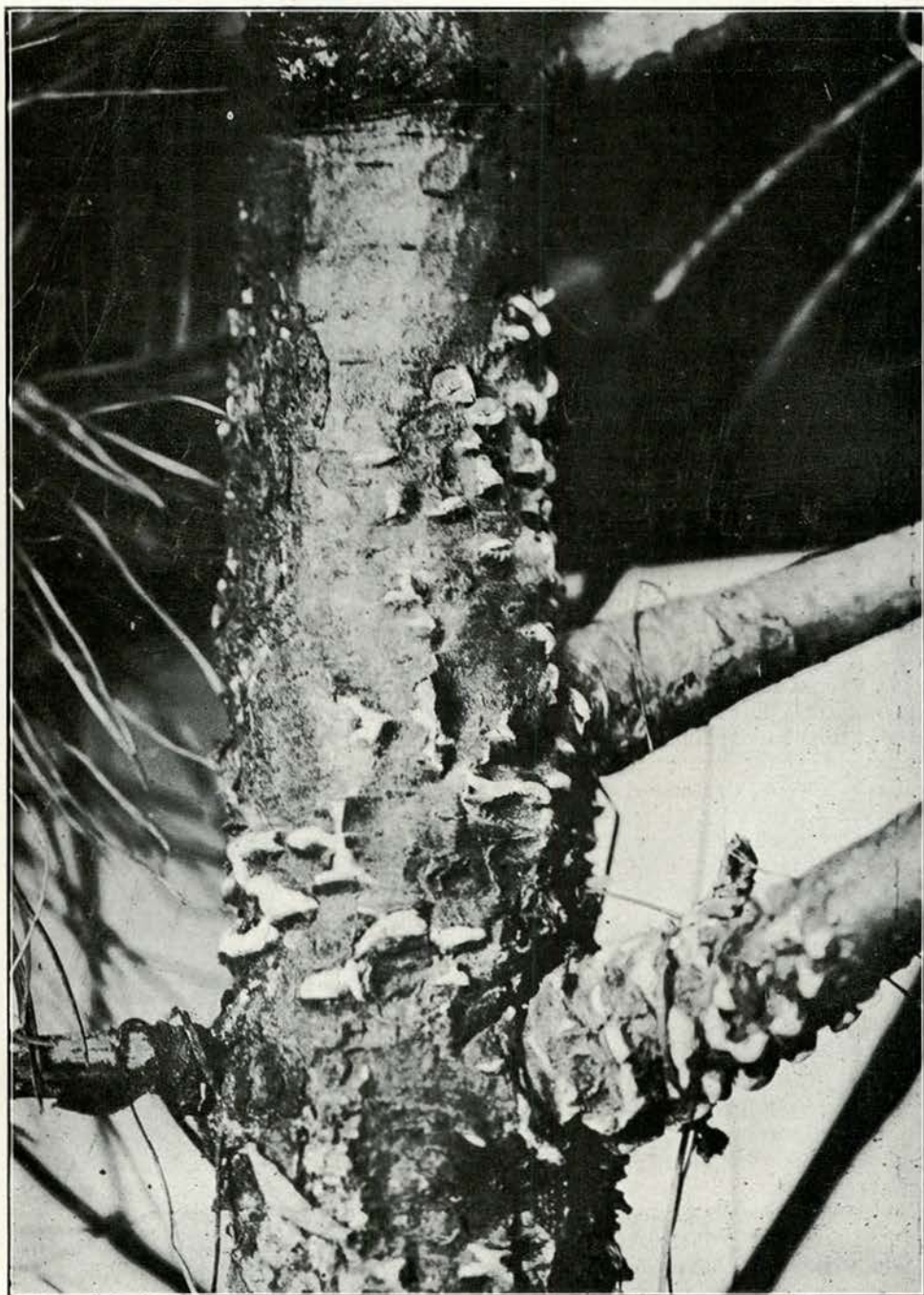
In many respects, plant diseases have much in common with animal diseases. There are those diseases both of plants and of animals, which are with us always. They do their damage, take their toll and continue to be with us. On the other hand, there are those diseases which visit us but seldom, - the causes of epidemics, plagues, calamities, - which leave destruction and desolation in their path. Such a disease of plant life is chestnut blight which practically wiped out chestnut in the eastern United States in a brief period of about fifteen years. Such a disease is white pine blister rust, which unless controlled,

now threatens to destroy Idaho's most valuable timber tree, - white pine.

Since the discovery of white pine blister rust in the west in 1920, considerable information concerning the disease under western conditions has been collected by the Office of White Pine Blister Rust Control and to some extent by other agencies. It is from the above sources that the information herein contained was obtained.

Although there is still a little doubt as to the exact time when blister rust was introduced into the west, the evidence strongly indicates that as far as is now known, it was first introduced in 1910 on a shipment of *Pinus strobus* seedlings from Ussy, France. There is also considerable evidence to show that the disease might have been brought into the northwest at several different times but the above mentioned case is apparently the earliest.

Since the time of its introduction, blister rust has made rapid progress in its spread especially in a northeasterly direction. This is undoubtedly not only due to the fact that during the spring and early summer the general direction of rain bearing winds is from the southwest, but also to the fact that cultivated black currants are more common to the northeast. It is also during this late spring and early summer period that most of the aeciospores are produced. From the probable original point of infection, which is Vancouver, British Columbia, blister rust has now spread as far south as Ilwaco, Pacific County, Washington, and north to the northern limits of the range of western white pine, a distance of practically 150 miles in both directions. In all probability, the infection found at Revelstoke, British Columbia, is a distinct introduction of the disease and not connected with



WHITE PINE BLISTER RUST

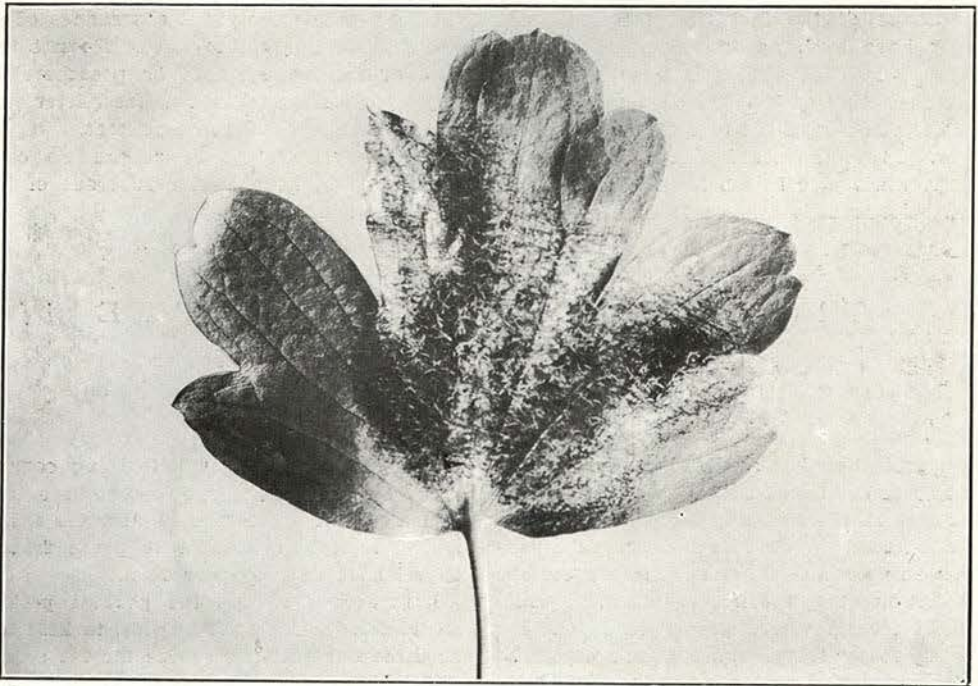
The stage of the disease produced on pine appears in the spring and early summer. The blisters or pustules are a bright orange yellow color. Each one of these blisters liberates millions of spores which carry the disease to currants and gooseberries.

the Vancouver infection. If the Revelstoke infection spreads towards the south as rapidly as the disease has spread on the Pacific Coast, the disease will be entrenched in the heart of the white pine area of the north Idaho by 1935. It is possible also, unless the greatest care is taken in the enforcement of existing quarantine regulations, that the disease may be introduced into Idaho by artificial means at a much earlier date.

Some of the most important data collected by the Office of White Pine Blister Rust Control are those concerning the relative susceptibility of various species of currants and

ing the disease in a new locality, *R. nigrum* (the cultivated black currant and its varieties) is of greatest importance not only because it is most susceptible to the disease but also because it usually stands exposed in gardens and is not shielded by the surrounding vegetation as are the native species in the forest. For these reasons it is absolutely essential, in order to keep the disease out of Idaho, that all cultivated black currants in the state be destroyed at once.

There is another point in connection with the cultivated black currants which is worthy of mention. Blister rust can spread from most



WHITE PINE BLISTER RUST

Two stages of white pine blister rust are produced on currants and gooseberries. The late stage, pictured above, forms clusters of brown horn-like columns of spores, which carry the disease back to white pine trees.

gooseberries to the disease under Pacific Coast conditions. Based upon his observations on naturally infected *Ribes* in the northwest, Dr. Pennington has placed them in the following order with reference to their apparent susceptibility and probable capacity to become infected from a far distant pine infection: *R. nigrum*, *R. bracteosum*, *R. sanguineum*, *R. divaricatum*, *R. laxiflorum*, *R. lacustre*, *R. vulgare*, *R. viscosissimum* and *R. lobbii*. From the point of view of establish-

varieties of currant and gooseberries to pine only for a distance, under most conditions, of 300 yards while the disease may spread from the cultivated black currant to pine for a distance of at least one mile.

The question of the probable damage this disease will cause to western white pine is of greatest interest and the data so far collected are anything but encouraging. For example, the data gathered on a sample plot at Daisey Lake indicate that 96 per cent of the

white pine on the plot will have been killed ten years after infection. The trees on this particular plot were infected in 1915 and 1916 and by the spring of 1922, or about six years after infection, 40 percent of the trees had already been killed.

That western white pine is very susceptible to the disease is shown by the fact that many of the infected trees show an unusual number of cankers. For example, a 36 year old tree in the Daisey Lake region had 353 cankers or an average of seven per branch. Another tree 28 years old had 316 cankers or an average of 10 per branch. These figures, although high are not unusual and do not give an exaggerated idea of the severity of the infection. On account of the fact that infected trees usually have such an enormous number of cankers, death of the tree usually results from the killing of the branches rather than from the girdling of the tree trunk by a stem canker. From the standpoint of the mature western white pine in the Inland Empire this has a serious aspect since it does not seem

unreasonable to suppose that these mature trees may be killed in a similar manner. It has been generally supposed that it would take quite a few years for blister rust to kill these mature trees even after they had become infected but there is little evidence in support of this supposition.

In order to postpone as long as possible, the day when blister rust will finally get into Idaho and in order that it may be controlled after it does get in, the best efforts of private, state and federal agencies are required. The general public itself has a part to play in this program,- a duty to perform. The most important immediate step is to free the state of all cultivated black currants. Almost equally as important is the strict observance of state and federal quarantine laws. Do not transport or receive currants or gooseberries or white pines from regions where blister rust is known or suspected to be present.

If these two steps are taken we can at least hope to keep blister rust out of Idaho for some time.

TRAINING COURSES FOR FOREST SERVICE PROTECTION FORCE

By PAUL H. GERRARD, '23

Fire protection has assumed paramount importance in the forest activities of the nation. To cope with the situation all possible means are being used to effect as efficient an organization as possible. Permanent employees are used for directing the fire organization while on most forests where protection is the big problem, many temporary men are employed for a short period each year. Since it is only natural for the desirable type of men to desire and accept permanent work whenever possible, it is not possible to depend upon men for temporary jobs year after year unless the fire season fits in well with other seasonal jobs. The work is a profession in itself and proficiency can be acquired only by training and experience. Since it is not possible to secure all of the former employees year after year, it means that new men must be employed. These men to be of most value should have experience and knowledge of the protection work, and the work necessary to maintain a protective organization. To prepare the men for this work and to develop men for the more responsible positions, it has been

found desirable to give a training course of three days duration. To a certain extent it will supplant experience in that the inexperienced man will be able to profit from the experiences of the older men.

Last season it was the general policy in District 1, U. S. Forest Service, to hold a two or three day training course for the selection and training of protection men. The courses given varied to some extent in the different forests. Some included written examinations and field tests. Wages were paid in accordance with the ratings received in the examinations. The results of the courses given proved that the time spent in giving the instructions was more than offset by the increase in efficiency and interest of the men in their work.

The following plan is taken in part from "Instructions and Training for Protection Men," issued in 1922 by District One, U. S. Forest Service. It has been further worked out to best suit the needs of the Clearwater National Forest, where it is intended for use this season.

Clearwater National Forest Selection and Training of Protection Men

I. Object:

The training and instructions of the protection force is furthered in order to obtain the highest possible standard in the protective organization. Hence, it is planned to give instructions and to rate each man on the things ordinarily expected of a forest guard.

A good forest guard should, of course, be possessed of ordinary intelligence. He should be dependable and industrious, have plenty of common sense and judgment and be otherwise endowed according to commonly accepted standards. We need not dwell upon the analysis of personal standards but get down to plain statements regarding the things most tangible that are expected of most forest guards. In so far as personal qualifications are concerned, we want to secure the very best men possible who reside in or near the region to be protected.

II. Ideal Standards for Selection and Training of Guards:

1. Report for duty properly equipped for the work at hand. Shoes should fit and in most cases should be hob-nailed. Clothing should be of such nature and of such quality as to enable the applicant to convey the impression of a woodsman. Should be equipped with a sharp substantial pocket knife and a watch that will keep time.
2. Physically able to carry a standard fireman outfit up and down mountains for the better part of two days. Physically able to fight fires at the end of such a trip. Able to cook his own meals and sleep on the ground. Willing to place duty before pleasure when occasion demands a display of physical endurance. In other words, should not be adverse to the life of a fireman or woodsman.
3. Know where to build a camp fire and when it is safe to leave it.
4. Know how to fight a small forest fire. Be able to construct a safe trench. Should appreciate the danger from burning snags, burning roots, rolling logs, etc. Know that the safe fire like the unloaded gun oftentimes does the greatest damage. In other words, know through experience and training when a fire is safe.
5. Be able to convert the reported azimuth reading into a compass reading and to place himself in the line of sight between the lookout and the fire. Have the necessary perse-

verance to actually put himself in line with the fire, when this is necessary, in order to find it.

6. Qualified to fill out a fireman or lookout report, also to keep a diary properly. For the purpose of the report should be able to name and distinguish the more common species of timber. Be able to tell a section line when he sees it, to determine the location of a small fire with reference to the section lines and to place it in the proper forty on the fireman map.
7. Be able to pace out an acre of ground and to report the acreage of a small fire.
8. Know when his compass is set for declination.
9. Should be able to level and orient a lookout board and report azimuth readings and distances for a given fire.
10. Know how to number sections and how to determine townships and ranges. In other words, know how to read and use a map.
11. Know the care and use of a carbide light or palouser and how to travel with one at night. Also know how to use one when fighting fires at night.
12. Should be able to pass a fair eyesight test.
13. Know the difference between a good telephone ground and a poor one. What telephone trouble to expect after a lightning storm and how to detect and eliminate it.
14. Should be able to ride and pack a horse and to manage a pack outfit in case of fires, independent of others.
15. Should have the proper attitude toward Forest Service work in general. Should be an all-around helper to the District Ranger. If a patrolman, should consider it perfectly proper to be transferred to fire suppression work. Before and after fire season should be willing to maintain improvements, construction of trails and telephone lines, to work on buildings and to otherwise qualify as a forest worker, not as a specialist hired to sit on a job at the end of a telephone line.
16. Be a man who is able to do things. Every man is not able to hang an axe, file a saw, temper a mattock, blow a stump, climb telephone poles, shoe horses, locate trails and to do the many other things which must be attended to in the Forest Service. He should have gained for himself the reputation of being a good all around man.
17. Above all things he should be dependable.
18. He should know how to take proper care

of his equipment and what action to take when any is lost, broken or worn out.

20. Should believe in fundamental principles of conservation for which the Forest Service stands. Should be familiar with the work of the Forest Service, particularly the local problems.

21. Proper attitude toward the game laws.

22. Familiar with the State Fire Laws, not only should the applicant be in a position to observe the fire laws himself but in addition he should be in a position to give correct information to others with whom he comes in contact.

23. Know what the Forest Service is trying to do in the way of preventing forest fires and what he can do to help.

24. Familiar with the many details of the most probable summer assignments including outstanding written instructions.

25. Familiar with the topography, bodies of timber, trails and telephone lines.

26. Familiar with the fire plan, fire organization on the District employed and special written instructions from the Ranger.

These standards may seem rather elaborate at first but do we ask a forest guard to do a single thing which should not be required of him in the heat of a severe fire season?

Under these standards the prospective forest guard is expected to know considerable about the fire and game laws. Ignorance of the law is not countenanced by the Forest Service when a local settler has killed game out of season or has set a fire without a permit in violation of the law. If people outside of our organization are expected to measure up to these standards, certainly it must be reasonable to require forest guards not only to know the laws, but to obey them. Incidentally our temporary organization offers a splendid opportunity to reach the people. A guard who is familiar with the purpose of the organization for which he is working, who acquires knowledge regarding the local problems of the Forest Service and who believes in the fundamental principles of conservation offers a means of contact with the public which cannot be overestimated. Training, according to the previously mentioned standards, simply means that we will have 60 to 100 men disseminating information to the public instead of only a few forest officers.

III. The Training Course.

It is planned to hold a three day course covering both general and specific information

as well as the practical work which would tend to result in a more efficient forest-guard. Each man will be rated on the oral and practical work. The test on the oral part will be an oral examination or discussion and on the practical work by actual field tests. The tests should be such as to make sure that each man has a clear conception of the main things included in the course and expected of him. The various topics covered in the course are grouped and specific weights or percentages assigned to each group for grading the men. The men will be rated in the following classes according to the total score made in the oral and practical tests: excellent, 90 to 100; good, 80 to 90; fair, 70 to 80; poor, 60 to 70. Those of the first two ratings will be considered as of protection type. Those of the third class would be considered as doubtful in the protective organization and the fourth class would include those considered as undesirable in the protective organization.

While wages will not be based on results of this examination it will indicate the capabilities of each man, and the rate of pay is regulated by capabilities of the individual.

All protection men will be required to take the training course and as many in the improvement crews as possible, for the latter are often called upon to aid and to fill vacancies in the protective organization.

The three days program will be as follows: The first day and one half will be devoted to the special instructions and information, and the afternoon of the second day and the forenoon of the third day will be devoted to practical problems in the field. The afternoon of the third day will be used to clear up hazy points and for the oral discussion.

The course will be conducted by at least two men and three if possible. Each ranger should make himself familiar with the main points and if the course is held on his district should collect and prepare the following equipment; lookout equipment; fireman's equipment; telephone equipment (brackets, insulators, wire); a telephone to work on; pack and saddle horse outfitted; two white flags at a distance of $\frac{1}{4}$ and $\frac{1}{2}$ mile apart respectively; cross-cut saws, one for filing demonstration and one for actual use; axe properly hung and sharpened. He should also measure in advance an irregular tract for pacing and estimation of area.

The program will cover the following points:

1. The training course.

A. The objects of the school.

- B. The ideal standards for selection and training of guards.
2. The Forest Service.
 - A. The objects of the Forest Service.
 - B. The benefits of the Forest Service to the public.
 - C. The organization of the Forest Service.
3. The Clearwater Forest.
 - A. Its area, assets and future prospects in timber, grazing, recreational uses, etc.
 - B. Policy or forest plans which have a bearing on the work.
 - C. The forest organization.
4. Fire.
 - A. The general problem in the United States.
 - B. Our particular problems.
 - a. The high fire hazard.
 - b. The job of protection, why it is our job, and the damage caused by fire in this forest.
 - c. The fire organization and duties of each man.
 - d. The fire forms, their purpose and use.
5. Fire Fighting.
 - A. Accurate location and elapsed time record.
 - B. Fire fighting equipment.
 - C. The fire trench, snags, etc.
 - D. General method of attack.
 - E. Estimating fire damage.
6. Fire Studies.
 - A. What is being done.
 - B. Results of studies.
7. Laws.
 - A. The federal fire laws.
 - B. The state fire laws.
 - C. The game laws.
 - D. Our duty in respect to the laws.
8. Azimuth and Compass.
 - A. Azimuth and compass thoroughly explained.
 - B. Orientation of map board, how and why.
 - C. Conversion of azimuth and compass readings and the possible uses.
9. Map Reading.
 - A. United States land survey system.
 - B. Contour map, its purpose and use.
10. Methods of Measuring Acreage.
 - A. Circular method.
 - B. Square or chain method.
 - C. The tendency to overestimate.
11. Estimating Distance.
 - A. How to check your estimate of distance.
12. Protective Organization.
 - A. Organization on the ranger district.
 - B. General instruction to firemen and lookouts.
 - C. Special instructions covering location of the men and duties of each.
13. Improvements.
 - A. Trail
 - a. Construction standards.
 - b. Maintenance standards.
 - c. Special instructions from rangers on certain projects.
 - B. Telephone
 - a. Construction standards.
 - b. Maintenance standards.
 - c. Special instructions from rangers on certain projects.
 - d. Telephone troubles.
 1. Ground rod-line-protection.
 2. Phone circuits and how to test.
 3. Care of the phone.
 - C. Buildings and associate improvements.
 - a. The construction and maintenance of buildings.
 - b. Fixing the permanent camps comfortable, handy and sanitary.
 - D. Signs.
 - a. The use and maintenance of signs.
 - b. The defacing and mutilation of signs.
14. Property.
 - A. Care of property.
 - B. How to file a saw, hang and sharpen an axe, sharpen or temper a mattock.
 - C. What to do when property is lost or broken.
15. General
 - A. White pine blister rust.
 - B. Other topics of general interest.
16. Practical field work.
 - A. Orienting map board.
 - B. Azimuth and compass reading.
 - C. Estimating distance, eyesight tests.
 - D. Fire fighting.
 - E. Reports, fire and diary.
 - F. Telephone troubles.
 - G. Telephone line work, climbing, splicing, etc.
 - H. Rations and ration lists.
 - I. Log cabin construction.
 - J. Identification of common trees.
 - K. Estimating acreage.
 - L. Packing.
 - M. Sawing wood.
 - N. Hiking and back packing.
 - O. Camping and cooking.
 - P. Estimating fire damage.

The following weights will be used in rating the men:

		Firemen: Lookouts
Training and experience (25 points)		
1. Training in or out of forest service which tends to fit man for job	20	20
2. Experience in Forest Service	5	5
Practical Field Tests (55 points)		
1. Personal equipment: watch, knife, shoes, clothing, condition of fireman's outfit	5	3
2. Orientation, azimuth, compass reading	6	12
3. Hiking and backpacking, enroute to fire, elapsed time start to arrival, accurate location	14	10
4. Fire fighting,	7	5
a. Trench, (width, depth, clean-safe, time to construct).		
b. Snag, (cut down in workman-like manner).		
5. Reports: lookout and smokechaser's fire reports, diary, etc.	5	5
6. Camping: fireplace and fire, cooking, making and locating bed, sanitation	4	4
7. Telephone work: Protector blocks and fuses, ground rod troubles, tests with telephone receiver	3	3
8. Eyesight and judging distance	2	4
9. Performance	9	9
a. Climb telephone poles, place insulators, splice wire, tie wire dead end and bracket, show how to perform the last two.		
b. Saw wood.		
c. List of rations for 2 men one week and such pack equipment for one pack horse.		
d. Name five common native trees.		
e. Pace an irregular area and give acreage.		
f. Make a list of material for a 12' x 14' log cabin, shake roof.		
g. Hew or adze a pole.		
N. B. Show men how to file a saw, hang an axe, saddle horses, handle powder and sharpen or temper a mattock.		
Oral Test (20 points)		
1. Fire manual and general instructions	10	10
a. Specific fire problem, 100 acres.		
b. Danger places after trench is around fire.		
c. Prevention of fires from passing beyond control.		
d. When is lookout board properly oriented? How is it done?		
e. Converting azimuth to compass reading.		
f. List the equipment you are supposed to take with you to a lightning fire.		
g. What is a Class B fire and what action is taken after reaching such a fire?		
2. Prevention	4	4
a. How to build a camp fire and when is it safe?		
b. Main features of Idaho fire laws, slash and burning permits.		
c. Only sure way to reduce loss from fires.		
d. State three of the six rules for fire prevention.		
3. Improvements	3	3
a. State five main points in telephone construction.		
b. State main points in trail construction.		
c. How to locate telephone troubles.		
4. Game laws and property	3	3
a. Game laws; bird, fish and big game.		
b. What action is necessary when equipment is lost, broken or worn out.		
Advanced Course.		
The results of the past season proved conclusively that the first training course aided in securing a more efficient organization and it is thought that an advanced course for those who have attended the first course, also for trail foremen, would not only train the man for the more responsible jobs, but increase the quality or standard of their work.		
A course of one or two days duration covering in greater detail information concerning the Forest Service, fire fighting, trail and telephone construction and any other special work going on in the forest would prove most valuable. The greatest benefit from an advanced course would be the general discussions whereby each one would receive the value of the other fellow's experience.		

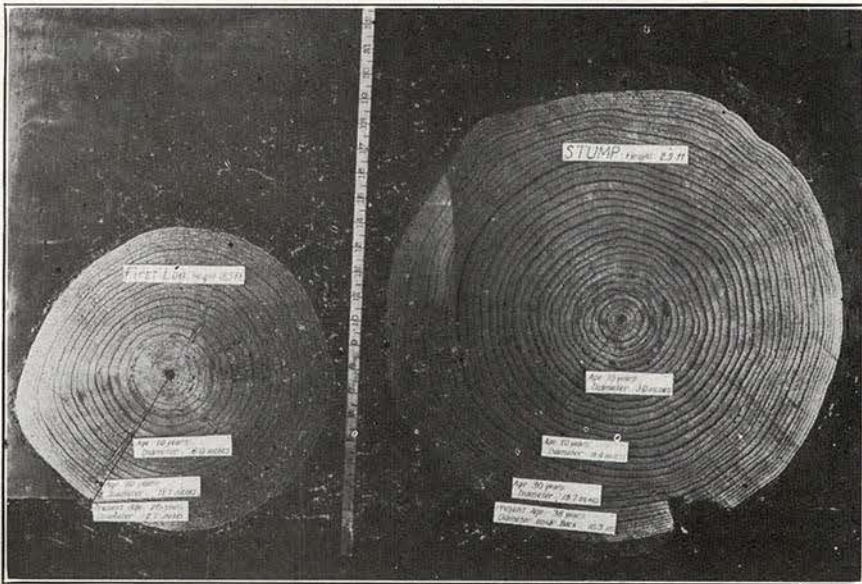
NOTES ON GROWTH AND YIELD OF SECOND GROWTH WESTERN YELLOW PINE IN NORTH IDAHO

By C. EDWARD BEHRE

Associate Professor of Lumbering.

In north Idaho there are large areas of forest land covered with dense fairly uniform stands of second growth western yellow pine, locally known as "Bull Pine," varying in age from a few years up to 40 or 50 years. For the most part these young stands of yellow pine are found along the foothills of the great forests of the Bitterroot and Coeur d'Alene mountains, fringing the borders of the fertile

which were for the most part present, altho inconspicuous, before the removal of the old trees, or else became established shortly afterward by seeding in from the scattered individuals not taken by the somewhat fastidious logger of early days. As a result we now have large areas of second growth in practically even-aged stands, many of which are rapidly reaching the stage where they will



SECTIONS OF A SECOND GROWTH WESTERN YELLOW PINE

showing the rapid growth which young trees of this species will maintain when given full light. This open grown tree had attained a diameter of 19.2 inches and a height of 57 feet in 44 years. The volume of its stem was 45.7 cu. ft. or about $\frac{1}{2}$ cord and it contained two merchantable logs, scaling 180 bd. ft., International Log Rule.

and thickly settled prairie lands to the west.

In the early days these hills supported a fine stand of virgin western yellow pine, which has practically disappeared before the axe and saw of the miner, the settler and the sawmill operator, but whose quality may still be judged by the rapidly decaying stumps everywhere present and the few remaining untouched areas. With the cutting of the virgin stand the ground was given over to the unrestricted development of the seedlings

and cease to be regarded as "brush" by assuming all the characteristics of thrifty young timber.

Very few of the local inhabitants realize the potential value of this young growth and in many cases it is even considered a nuisance. Fires are often allowed to run uncontrolled through these areas because the local residents see no value in the young trees and believe the grazing will be improved by their removal. Along the lower limits of the forest belt one often sees fine stands about 20 years

old being cut down so that the land may be placed in cultivation. The yield of fuelwood in these cases is very small, if any at all, because the trees are only beginning to reach a size which justifies their handling. It seems a shame to throw away in this fashion the growth of 30 years, because, with the sapling stage passed, the amount of wood produced in the next few years will be surprisingly great and holding these stands to take advantage of this fact, should pay good dividends.

In many cases it is doubtful whether agriculture can be made a success on lands cleared in this way, but even granting that the lands have agricultural value, potentially they are in a much better position for forest crops than for farm crops. When these lands are put under cultivation they come into direct competition with the fertile treeless area to which they are adjacent and the products must be sold in the same markets. The cost of clearing will equal or exceed the price for which improved farms in the open country can be purchased and then in most cases the distance to the towns, warehouses and railroads will be greater and the soil of poorer quality.

On the other hand these areas are in a most advantageous position from the standpoint of forest production. Lying adjacent to a large and thickly settled treeless area there will always be a strong demand for fuelwood, posts and lumber which these lands can most profitably supply. Farmers in this section often go thirty miles to get fuelwood for their winter's needs and each year finds the supply getting further back into the hills. The man with fuelwood for sale along the edge of the timbered belt will always be able to command a good price for his product, and as a corollary, the same will hold true of lumber

which may be cut by small mills and sold to the local markets more economically than that which is imported from distant mills.

Even foresters, who see in these young trees, boards with which our children may build their homes, and wood with which they may warm their hearths, have little positive information upon the exact quantity and quality of material which these stands will produce in a given period of time, or of the age at which their owners should harvest the crop in order to realize the maximum profit.

It is not easy to answer these questions because so few stands are available which have developed under the conditions which these young stands exhibit. In the virgin condition western yellow pine is practically always many-aged and very rarely do even-aged stands develop except as a result of cutting. The oldest cuttings in this section are not over 50 years old and hence sources of information as to what these young stands will yield when they reach 70, 100 or 150 years of age are very meagre. Measurements made of two tracts where the stand was approximately even-aged over a considerable area should therefore be of interest as indicating what may be expected from this second growth.

In both of these tracts about 5 acres were tallied in strips spaced to cover about 20 percent of the area and, in addition, sample plots representing normal fully stocked portions were laid out and sample trees felled and measured as a basis for computing the volume of the stand and the form of the trees. The accompanying table summarizes the results obtained on these two areas.

The first of these tracts covered at least 40 acres about 2 miles east of the head of Lake Coeur d'Alene. Its age was 99 years and there were 72.4 trees per acre, averaging

Cruise of Two Stands of Even-Aged Second Growth Western Yellow Pine

Area tallied acres	Age yrs.	Av. D. B. H. ins.	Av. Hght. ft.	Trees per A.	Volume per acre				Mean annual growth	
					Inside* bark cu. ft.	per cent bark‡	With bark cu. ft.	Bd. ft. Clark†	cu. ft.	bd. ft.
5.0	99	15.6	89	72.4	3020	28.4	3880	18,900	39.2	191
4.55	130	20.5	105	50.4	4605	28.3	5910	33,500	45.5	258

*From form class volume tables by C. E. Behre.

‡From sample plots, based on mean sample trees.

†Ratio of bd. ft. to cu. ft. taken from S. B. Show, Yield Table for Second Growth Yellow Pine in Calif., for stands of same age with trees of same size.

15.6 inches in diameter breast high and 89 feet in total height. The largest trees tallied measured 26 inches in diameter. On this area there were a few scattered veteran trees remaining. These were not included in the calculations altho they occupied some space and serve to reduce the average yield per acre.

The cruise showed a yield of 3880 cu. ft. per acre including only trees 8" or more in diameter breast high. At 90 cu. ft. per cord this is equivalent to 43 cords per acre of fuelwood not including the branches at all. Expressed in board feet in terms of Clark's International Log rule for a $\frac{1}{8}$ " saw-kerf, this amounts to 18,900 bd. ft. per acre, which is easily equal to the average amount yielded by the virgin stands in the original cuttings. The mean annual growth at 100 years in this stand is therefore 191 bd. ft., 0.434 cords or 39.2 cu. ft. That these figures are conservative is indicated by the fact that the stand was rather open and the cruise showed a density of only 61.5 percent of normal as expressed by the sample plots and that these plots had less than 1 percent of the volume for normal plots of the same age with trees of the same average size measured on the Lassen National Forest in California by S. B. Show.

The second tract for which measurements are available covered several hundred acres just south of Plummer. Much of this stand has been logged recently and cutting is in progress on the remainder at present. This stand is not over 130 years old. Borings taken in some portions of the tract indicated an age of only 120 years, but 130 is taken as the more conservative figure. Large portions of this tract were almost ideally stocked and showed remarkably well what may be expected if protection is afforded young even-aged stands of this species. The accompanying photograph shows a view of this fine stand taken from an opening along the highway. The trees average 20.5" in diameter breast high and 105 feet in total height.

A three quarter acre sample plot measured in the stand shown in the illustration showed 97.3 trees per acre and a yield of about 9200 cu. ft., 102 cords or 52,000 bd. ft. per acre expressed on the same basis as before.

The cruise of this area showed 50.4 trees per acre with a yield of 5910 cu. ft., of which about 17 percent was Douglas fir and western larch. The cordwood equivalent at 10 cu. ft. per cord is 65 cords per acre and expressed in board feet, Clark's International rule for $\frac{1}{8}$ " saw-kerf, this amounts to 33,500

bd. ft. per acre. The mean annual growth in this stand would therefore be 258 bd. ft., 6.785 cords or 45.5 cu. ft. per acre. Comparing this to the normal as indicated by the three quarter acre sample plot mentioned above we get a density of 64.3 percent and this index plot in turn has only about 74 percent of the volume of fully stocked plots of the same age and size of trees measured in California. These relations are approximately identical with those noted for the first area above.

This stand had been subject to severe reduction in numbers in recent years, not only from natural suppression, but more noticeably from insects and windfall. These agencies had reduced the density far below normal over much of the area, leaving irregular openings and thinning out the stand in the initial stages of the inevitable transition to the many-aged condition of the virgin forest.

A study of the figures for these stands does not give any conclusive information relative to the age at which the maximum average yield will be secured. The mean annual growth of the 130 year old stand is much higher than that of the 100 year old area, but the heavy losses which it has sustained in recent years raises the question whether a higher figure would not have been shown at an earlier date.

In studying the yield of second growth western yellow pine in even-aged stands the very interesting question arises as to how long this intolerant species, which eventually reverts to the many-aged condition, will maintain its even-aged character. Weidman has recommended a change in the system of management for western yellow pine in Oregon based on the premise that the next generation of trees would be even-aged. Show, in California, recommends a clear cutting system for second growth yellow pine and, from studies based largely on even-aged groups selected in the virgin stand rather than actual observation of the development of any particular even-aged stand over a large area, concluded that the cutting age should be about 120 years.

The evidence of the 130 year old stand presented here would tend to substantiate the results of the work in California, not on the basis of culmination of mean annual growth, but because the condition of the stand indicates that it is losing its even-aged character and that over large areas the losses through opening up of the stand would more than balance the growth after about 120 years. However, this evidence is by no means conclusive;

the behavior of other stands must be studied if they can be found. It may even prove exceedingly difficult to maintain the even-aged stands intact up to 120 years, because of the losses which will be suffered from insect attacks at earlier periods. Many instances of



Second Growth Western Yellow Pine.
52,000 board feet per acre at 130 years of age.

the breaking up of large bodies of young second growth yellow pine by insect infestation in spots have been observed and unless this can be controlled the forces tending to transform the even-aged second growth into stands of many ages by groups will be at work long before the new crop could reach maturity.

One point which the study of these stands seems to indicate quite clearly is the nature of the reduction factor which must be applied to a normal or index yield table to get results attainable in practice. The figures given above show that these two areas have only from 61 to 64 per cent of the normal indicated by selected sample plots and only 48 to 50 per cent of the yields for similar conditions indicated in the California yield table. The fact that yellow pine stands may be seriously opened up in spots by insect attacks at almost any period of their development, however, indicates that the conventional method of using the reduction percent of a young stand to predict its relation to normal yields in the future is exceedingly dangerous. To meet this condition empirical reduction factors for different ages, based on the measurement of selected stands, such as those presented here, may prove of considerable value and also serve to show how long western yellow pine stands may profitably be maintained in even-aged condition.

THE TALE OF A CAPTIVE BULL MOOSE CALF

By FLOYD M. COSSITT, '24

Indian Lake is one of those picturesque little bodies of snow fed water that one finds high in the mountains of the Selway National Forest. Surrounded by open patches of meadows and partially timbered slopes, the lake itself does not cover an area of more than 100 acres and varies in depth from a few feet at the upper end to over 20 feet at the lower end. Conditions are most favorable for the growth of the heavy mat of tangled grass and moss which covers the entire lake bottom.

During the summer months, from the middle of July until late in September, the few survivors of the once great herds of moose frequent the shores of Indian Lake. The open meadows and uplands afford a summer range where, protected by the game laws, they may

rear their young unmolested and build up a store of strength for the winter months.

From the Ranger Station, a hundred yards or so from the lower end of the lake, it is not an uncommon sight to see as many as two or three moose diving or splashing about in the cool water seeking the tender shoots of grass on the lake bottom. These tender morsels they prize very highly. One cow in particular was very regular in her visits to the lake. She came when the shadows began to lengthen in the afternoon, and stayed on until it was dark. She became accustomed to the men at the Ranger Station, and if they maintained a discreet distance, she never showed signs of fright.

Late in the month of July something in her

worried actions led the men to believe that she had hidden a calf somewhere along the lake shore. Tom Alexander, one of the men from the station, found the little fellow lying helplessly upon his back, wedged in a small ditch and all but dead. Evidently the mother had left him there while she indulged in her daily swim and from the trodden condition of the ground about him, her efforts to extricate him from his precarious position had been futile.

The discovery of the little fellow immediately suggested the idea of nursing him back to health and of taking him out to civilization. It was necessary to construct a stretcher of poles and canvass to transport the calf to the station, for after lying for at least 24 hours upon his back, he was unable to stand without support. A diet of mare's milk and a particular species of fireweed soon put the little fellow on his feet again.

In view of the scarcity of moose in the west, the game department of the State of Idaho, learning of the capture of this calf, expressed a desire to secure him for the zoological garden in the park at Boise, Idaho, and accordingly took over the care of the calf. Instructions were given to take him to Hamilton, Montana.

By this time "Bull," as he was affectionately nicknamed, was very much alive and able to frisk about at the end of his tether rope. He was of a very temperamental disposition and hard to befriend. It was expected that perhaps his mother would try to reclaim him, but if she ever did recognize her progeny, the man smell probably kept her away.

The trail to Hamilton, Montana, is a typical mountain trail, traversing some of the roughest country in the Bitterroot Mountains and a hard trail for man or beast. Preparation for the trip was completed about the fifth of September when Bull was quite able to travel if it so suited his fancy, and a grand start was made for Hamilton. Considering the fact that Bull was being led away from his natural surroundings, he travelled very well the first day. Considerable progress was made with Bull trailing quietly at the end of his rope and evincing little interest in his new surroundings.

Such angelic behavior on the part of Bull was too good to be lasting. On the following morning in spite of all the coaxing and enticements which could be conceived for a

moose calf, Bull refused to move. However, he was finally persuaded to make a reluctant start down the trail. After about twenty minutes of slow travelling, the trail unfortunately passed through a most luxuriant field of Bull's favorite brouse, the fireweed. He deliberately laid down and proceeded to complete his breakfast. Now with a full stomach, after eating his fill, he became sleepy, and after all efforts to move him had failed, camp was made for the balance of the day.

From then on, travel became most painfully slow and exasperating, and an average of one mile per day was all the progress possible for a number of days.

After the men had about exhausted their store of patience and used up much of their strength in futile attempts to coax, persuade



"BULL"

Captive Moose Calf at Indian Lake, Idaho

or force Bull into travelling, they built a travois of poles, hitched a horse to the contrivance and completed the trip to Hamilton without further incident. However, it would seem that it was ordained by the Great Spirit that Bull's presence was not to grace the parks of Boise, for, as a result of a fatal feeding of overheated milk, Bull's travels were brought to an abrupt and tragic close, soon after the arrival of the little caravan in Hamilton. Although many were deprived of an opportunity to view at close range a moose, native to the State of Idaho, Bull's spirit is probably more free to roam the mountains of his home in the Selway National Forest than his spirit would have been behind the bars of the zoo in Boise.

GRAZING RECONNAISSANCE

By C. W. WATSON, Instructor in Forestry

Most of the forage in the National Forests lies in mountainous areas at high elevations and constitutes what is known as the summer range. This range is usually inaccessible for stock in winter because of snow. Its period of use runs from May to November or for a shorter season, depending on altitude. The fresh forage of these high ranges is very valuable for the stock which probably has been spending the winter eating hay in the feed lots or grazing the dried forage of winter range which may be utilized during that period because of a lower altitude and less snow.

Past use of the ranges has very often resulted in deterioration caused by grazing too

for which might have any practical bearing on the management of the range.

Grazing reconnaissance is primarily a survey of forage resources and includes the mapping of various types of forage and poisonous plants, the estimation of its quantity and quality, its seasonal development, etc. The present condition of the range is noted, as well as the occurrence and nature of the water, and descriptions are made of the forest cover, topography, fences, salting places and game animals using the area. Before a range study can serve as a basis for management, it must answer four questions: (1) What kind of stock is the range best adapted to? (2) How



Sheep on Timbered Range in Idaho

many head of stock or putting the stock on the range too early in the season. The policy of the Forest Service is one of continued use to full capacity and this means that the range should be so used that its production of forage will not decrease in quantity or quality. To this end many studies have been made and many data collected, facilitating the formulation of the principles of range management and their application. The most useful and scientific attempts to analyze and record range conditions have taken the form of range or grazing reconnaissance—a systematic study of field conditions in reference to every fac-

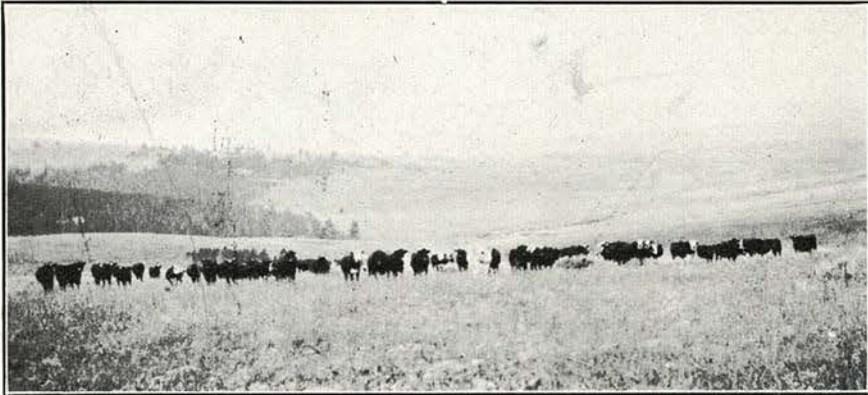
many head can be run on the range in its present condition? (3) How early in the summer will the stock be allowed to come onto the range and when will they be taken off? (4) Is the water sufficient and so located that the range can be utilized? There are other points upon which information is usually desired but, when sufficient data have been collected to answer these four questions, an initial management plan may be worked out with considerable accuracy. I say an initial plan because it is almost certain that any untried plan would have to be changed to conform to the reactions of the stock and their influence on

the range when the scheme of management was first tried out. Practical application is the best criterion.

The field work of reconnaissance is accomplished during the summer months and early fall, often while the stock are utilizing the range. The data are collected by running parallel compass lines one half mile apart, the field man mapping and writing up descriptions as noted along these lines. The men

over, he should be a congenial worker, of good physique and an excellent hiker because much of the work may be done on foot. These qualifications are essential. If, in addition, he be a good woodsman with some knowledge of stock and game, horse packing and cooking, his success should be assured.

For a student interested in range management of stock or in grazing problems, service on grazing reconnaissance will compensate him remarkably well. He will have an oppor-



Cattle on National Forest Range

usually work alone. The crew may consist of four or more members and a cook—the latter a most important person. The party chief is a Forest Service official, as occasionally are some other members of the crew. Frequently forest school students are hired for this work if they have the proper qualifications. To make good on reconnaissance, a man should have some knowledge of systematic botany and forest surveying, especially the use of the compass and pacing. He should understand the rectangular system of surveying used by the General Land Office in the West. More-

tunity to gain an intimate knowledge of the conditions on the great stock ranges and an understanding of the problems and their solution which will be for him a firm foundation for further work along grazing lines. For the individual with the proper qualifications who suspects but has not confirmed his interest in matters pertaining to grazing, a season spent on reconnaissance offers splendid, healthful work and a comprehension of the wild ranges where our great western stock-raising industry was born and has developed and on which it relies for its maintenance.

THE SONG OF THE WANDERER

With my knife and gun and blanket
 And some coffee in a sack—
 With my free soul just a-roaming
 And no burdens on my back—
 With just miles of trail behind me
 And just miles of trail ahead
 Toward the mystery land o' future
 My wand'ring feet must tread.
 So I leave the past a-fading,
 Meet the present with a smile,
 And just dream of what's a-coming
 At the end of every mile.

Stanley Foss Bartlett.

THE SCHOOL OF FORESTRY, 1922-1923

By C. EDWARD BEHRE
Associate Professor of Lumbering

The past year has been one of continued progress and accomplishment for the Idaho School of Forestry. There were no changes in the teaching force which means increased stability and better quality of instruction in all courses. The enrollment in the regular curricula was especially gratifying this year in that it exceeded any previous registration and showed a better distribution of the men among the different classes. There were 7 seniors, 8 juniors, 17 sophomores, 26 freshmen, 9 rangers and 13 unclassified, making a total of 80 regularly enrolled men exclusive of those from other department and those taking the correspondence course in "Lumber and Its Uses."

Closing the Vocational Course.

The 13 unclassified students represent the last of those in the special course for Federal Vocational Rehabilitation students. After next year this course will be discontinued altogether and thus permit a greater concentration of effort on the part of the faculty upon the regular courses. The record being made by many of those who took Vocational Training in forestry at Idaho reflects credit upon the school and assures us that our efforts in providing this work for vocational trainees was well worth while. Although a great many vocational men came to the school with scarcely any foundation and little intention of sticking to forestry, a very good number of them completed the two years of work and have found satisfactory openings in the U. S. Forest Service or elsewhere. As an index of how our vocational men, all of whom took the rangers examination last fall, compared with the general run of applicants for this position from the entire country, 9 out of 14 or 64.3 percent passed the ranger's examination while for the entire country only 194 out of 726 or 26.7 per cent passed. Those of our men who failed to pass last year were given a new examination this spring from which no returns have yet been received.

Forest Service Lecturers.

During the winter months the regular instruction was supplemented again this year by several series of lectures by officials of the U. S. Forest Service detailed especially for that purpose.

A series of five lectures, supplemented by several reels of motion pictures, dealing with the public relations work of the U. S. Forest Service was presented to the students of the School of Forestry during the week of January 22 by Theodore Shoemaker, U. S. Forest Service, Missoula, Montana. The motion pictures were open to the public and attracted a large audience and much favorable comment upon the work of the Forest Service. The first of these pictures entitled "When Elk Come Down" presented in a very fascinating and convincing manner the problem of saving the elk in the Yellowstone National Park region from extinction by providing adequate winter range and protection against "tooth hunters." The second film entitled, "Mountains and Meadows" showed some of the wonderful scenic resources of the National Forests off the main routes of travel with an invitation to everyone to make full use of these great public properties and aid in their protection. The scenes were taken in the Gallatin National Forest and included one reel of pictures of the Bozeman round-up.

Mr. J. W. Girard, Logging Engineer, U. S. Forest Service, Missoula, Montana, gave a series of ten lectures during the week of March 5 covering timber appraisals and logging cost studies. Mr. Girard is a recognized authority on these subjects and presented at first hand, methods of training timber cruisers and of analyzing the costs of logging operations which he had worked out himself and used successfully for a number of years. The material of Mr. Girard's lectures and the enthusiasm with which he presented them constituted a real inspiration to all the students who heard him and especially to those contemplating logging engineering as a profession.

A third series of lectures on problems of personnel in the U. S. Forest Service was given during March by Mr. H. C. Shepard, Supervisor, Boise National Forest, Boise, Idaho. Mr. Shepard discussed the qualities which fit a man for Forest Service work and lead him to success and then outlined the systems in use for following up the accomplishments of the various members of the organization, planning the work to be done on each district in

advance, and in other ways improving the efficiency of operation. In his final lectures Mr. Shepard took up grazing on the National Forests and discussed a few of the problems arising from the use of the national forest range.

The students of the School of Forestry were given a vivid picture of the seriousness of insect losses in the forests of the northwest in a special lecture during April by Mr. James C. Evenden, Forest Entomologist, Forest Insect Field Station, U. S. Department of Agriculture, Coeur d'Alene, Idaho. In addition to this lecture Mr. Evenden presented to the public here a fine series of lantern slides and, at a later date, a motion picture showing examples of insect depredations in the forests and methods being used to control them.

Watson on the Spokane meeting of the National Wool Growers Association.

At a special meeting, May 17, held in the Sigma Alpha Epsilon house, Mr. Watson gave a demonstration of camp cooking, Howard A. Gatley gave instructions in first aid methods, Floyd W. Cossitt gave a short talk for the benefit of those going out into field work in the Forest Service for the first time this summer, and Mrs. Behre furnished refreshments.

The social activities of the club were as successful as in previous years. The "Timber-beast Hoedown" and the annual banquet are reported in detail elsewhere. An innovation in the activities of departmental clubs on the campus this year was the informal "Waffle Feed" held at Huff's Cafe early in December. This affair was well attended and helped con-



Class in Forest Surveying with Traverse Boards

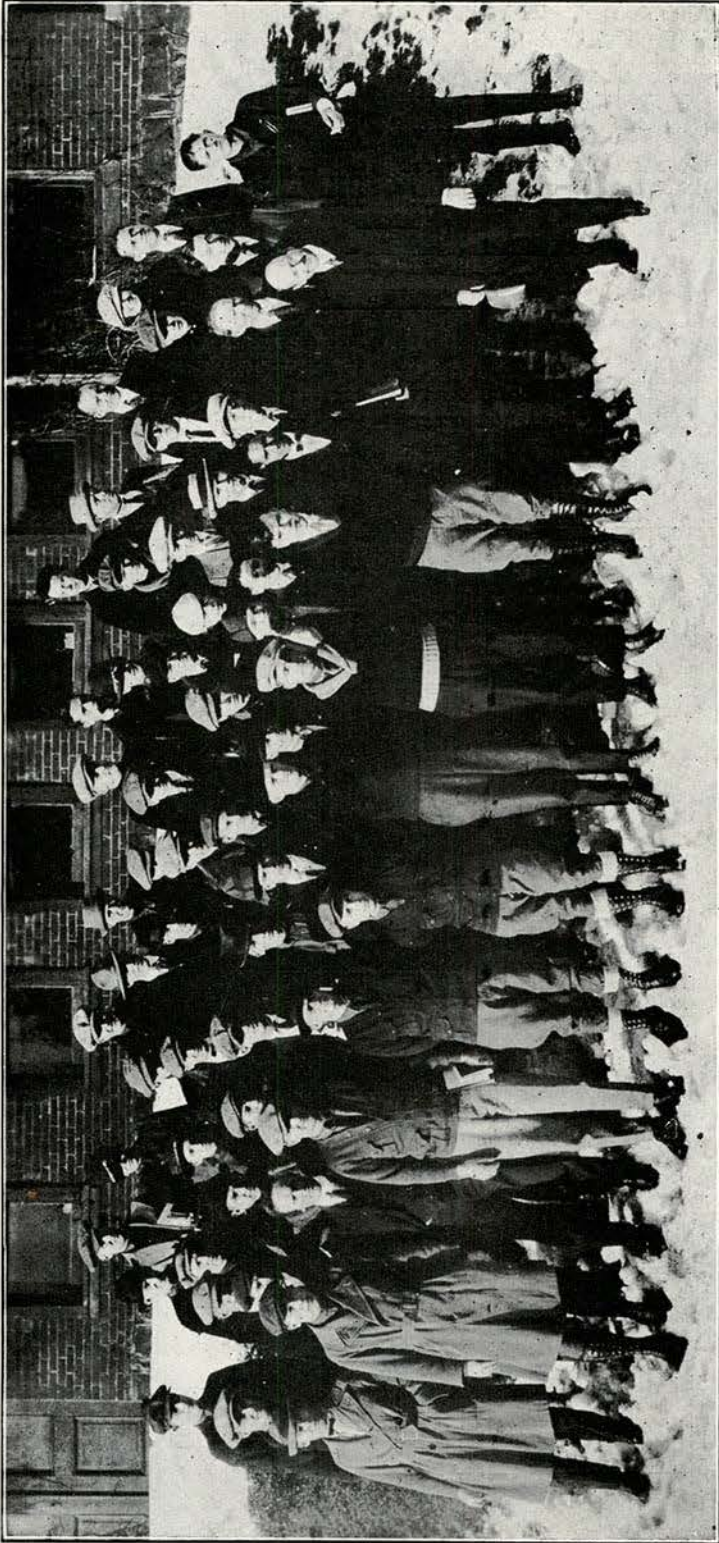
The Associated Foresters

The forest club of the students of the Idaho School of Forestry, known as the Associated Foresters, has also had a successful year. The meetings for the most part were held in the University Hut, where refreshments could be served at the close of the regular meetings. The programs included a talk by Dean F. G. Miller on the prospects of the school for the year; an outline by Professor C. E. Behre of the proceedings of the Pacific Logging Congress at Tacoma, Washington; a talk by P. D. Sharma on his experiences with the white pine blister rust control work and at the Priest River Experiment Station; a summary by Dr. Henry Schmitz of the Land Use and White Pine Blister Rust Conferences of the Western Forestry and Conservation Association at Portland, Oregon; and a report by Mr. C. W.

siderably to stimulate interest in the club and promote a more united spirit among the forestry students.

A School Forest

Plans have been under way for the past year to secure a section of land not far from Moscow suitable for a demonstration and experimental forest. In order to be of maximum use for class instruction purposes such a tract should be easily accessible to the school, and with this in mind a section of University land six miles from Moscow has been selected. This tract is not much over a mile from the state highway between Moscow and Viola and can be reached at almost any season of the year. It has all been logged off and a portion of it burned rather severely after logging but it is admirably suited to silvicultural investigations. For the most part this section



Associated Foresters, University of Idaho, 1922-1923

is reproducing to a dense stand of western yellow pine except on the northern slopes where the young stuff is a mixture of Douglas Fir, western larch, western yellow pine and white fir. Many of these young stands are already in need of improvement cuttings and thinnings and the burned area will afford ample opportunity for experiments in artificial reforestation. A plan to secure this section for the permanent use of the School of Forestry has been presented to the Board of Regents and action is expected in the near future.

Adjoining the section mentioned lie other areas of fine young western yellow pine which it is hoped may be acquired later on to round out the holdings and afford better opportunities for studies of growth and permanent sample plots.

New Wood Collections

The School of Forestry has recently acquired through the courtesy of the Bureau of Forestry of the Philippine Islands a complete, well labeled set of 130 different native Philippine woods. The Forest Research Institute of Java has also furnished a display of 18 woods from that country. These collections improve considerably the equipment of the school for work in wood technology.

Forestry Exhibit at State Fair.

A very interesting and striking display of publicity material was sent by the Idaho School of Forestry to the State Fair at Boise and to the State convention of the Federation of Women's Clubs at Burley last fall. The display consisted of a collection of unusual products made from wood; another collection and diagram showing the great variety of the chemical products derived from wood, a large chart in the form of a tree showing the activities of the Forest School and the opportunities open to trained foresters; a set of publications of the School of Forestry; a wonderful assortment of photographs of the white pine forests of the state and a chart showing the importance of the forest industries to the state and the necessity of protecting the forests from fire.

Forestry Legislation

Before the meeting of the state legislature last winter a representative committee headed by Dean F. G. Miller held several meetings, discussed all phases of the forestry situation in the state and framed a forestry bill which was presented to the senate but failed to pass. The three chief features of the proposed legislation were (1) Provision for a state board of forestry and a state forester, (2) Provision

for compulsory patrol of all timber lands of the state and extension of the fire districts to cover the entire state and make more effective the burning permit law, (3) A more adequate slash disposal section which would have required piling and burning along areas of special hazard and elsewhere under certain conditions and would have provided for slash disposal on areas on which only a part of the timber had been removed. The urgent need for more adequate forest legislation in Idaho is recognized and the School of Forestry accepts as one of its legitimate functions the molding of public opinion and aiding in the framing of such measures as will lead to the conservation of the forest resources of the state.

Forestry Program at Sigma Xi

On April 23, the Idaho Chapter of Sigma Xi held an open meeting at which a forestry program was presented by the faculty of the School of Forestry. Dean F. G. Miller outlined the forestry situation in North Idaho showing by charts and maps, the ownership of forest lands and standing timber, the rate at which they are being cut over and the dependence of many of our communities upon the lumber industry for their existence. Professor C. E. Behre then showed by a series of lantern slides the results of uncontrolled cutting followed by broadcast burning of slash or fires in the white and yellow pine types of Idaho and how the cuttings could be conducted and brush piled and burned in order to provide a new crop of timber for the future. Dr. Henry Schmitz closed the program with a paper showing the importance of forest products in the everyday life of the nation and the need for investigation to improve methods of utilization and make new products available on a commercial scale.

Spring Field Trip

The annual logging engineering field trip was made this year to the operations of the Edward Rutledge Timber Company at Clarkia, Idaho, during the week of May 21. Eight upperclassmen accompanied by Professor C. E. Behre made the trip which included a short inspection of the sawmill of the Potlatch Lumber Co. at Potlatch, and of the cedar yards of the E. T. Chapin Company at Bovill, in addition to the detailed study of the logging operations at Clarkia. The operations of the Edward Rutledge Timber Company were especially suited for a trip of this kind as in the short time available the students were able to study practically every method of logging in-

cluding the drive on Marble Creek, the incline railroad, chutes and several phases of power logging.

Toots-E

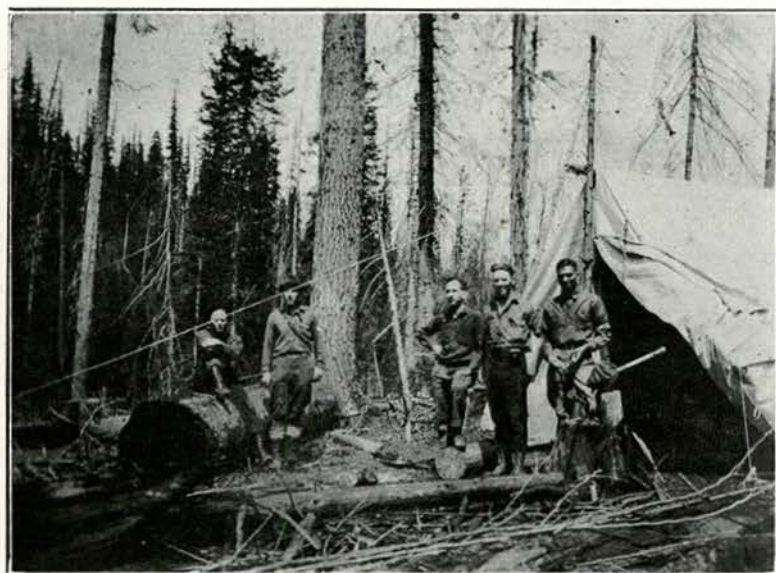
Through the courtesy of the C. N. Lovsted Company of Seattle, Washington, the School of Forestry has been given the use of one of the popular electric logging signal whistles, known as "Toots-E," for instructional and demonstrational purposes. The students have adopted a novel method of becoming familiar with the installation and operation of this signal whistle by installing it on top of the university heating plant, wiring it to the gymnasium and athletic field and using it to announce and broadcast the victories of the Idaho athletes.

Dr. Schmitz Honored by A. A. A. S.

A few months ago Dr. Henry Schmitz, Associate Professor of Forest Products, received the honor of being made a Fellow of the American Association for the Advancement of Science in recognition of his studies in wood decay which have been in progress for several years. Several bulletins have been published as a result of his research and these have been in demand from all sections of the country.

Publications

During the past year a number of important papers have been prepared for publication as a result of research by the faculty of the School of Forestry. The work of Dr. Schmitz has yielded four papers which will appear



Logging Engineering Class in Camp

White Pine Blister Rust Cooperation

The School of Forestry has been able to render a valuable service to the state in the active part it has taken in the campaign to prevent the entrance of the White Pine Blister Rust into Idaho. Dr. Henry Schmitz, has been directing the control work in Idaho in cooperation with the U. S. Bureau of Plant Industry, the North Idaho Forestry Association and the State Department of Agriculture. Last summer Dr. Schmitz had charge of a crew of six men who scouted the entire state for black currant bushes, and a crew working on the eradication of black currants is again in the field under his direction for the present season.

shortly in various technical journals and a bulletin which will be published this summer by the School of Forestry. The titles of these and the names of the journals in which they appear follow:-

Preliminary Note on Physiological Specialization of *Fomes pinicola*—to appear in "Science."

Studies of Wood Decay IV. The Effect of Sodium Carbonate, Chloride and Sulphate on the Rate of Decay of Douglas Fir Sawdust Induced by *Lenzites saepiaria*, Fr. with Special Reference to the Decay of Wood in Alkali Soils,—to appear in "American Journal of Botany."

Notes on Wood Decay I. Wood Destroying

Properties of *Polyporus volvatus*, Pk.,- to appear in the "Journal of Forestry."

Note concerning Leaf Cast of *Larix occidentalis*, *Hypodermella laricis*, Tubeuf, in North Idaho, to appear in "Phytopathology."

Studies in Wood Decay V. Physiological Specialization of *Fomes pinicola*—to be published as a bulletin of the Idaho School of Forestry. In this bulletin Dr. Schmitz has shown that a fungus like *Fomes pinicola* which is found upon a number of different tree species as hosts has developed physiological specialization. Whether this specialization is due to host influences or not is not certain. The fact that physiological specialization does exist, however, opens up a large and interesting field of great economic importance because, should it develop that the different strains of the wood destroying fungi are limited to a single host species, the problem of forest sanitation in cuttings of mixed species, where defective inferior species must be left on the ground as a menace to the new crop of valuable species, would be largely eliminated.

Early last fall Dr. Henry Schmitz was called upon to read a paper on the Pine Butterfly, which made serious inroads on the forests of Idaho last summer, before the North Idaho Forestry Association in Spokane. Following this meeting Dr. Schmitz prepared an article on the Pine Butterfly Epidemic in the West in conjunction with Victor Jones of the department of entomology, University of Idaho, which was published in "The Timberman" for January 1923.

The studies of stem form upon which Professor Behre has been engaged for the past two years are beginning to yield results and a preliminary note covering the findings has been submitted to the "Journal of Forestry" for publication in the near future. Professor Behre believes the Hojer formula upon which the form class taper and volume tables in use in Sweden have been based gives values which are not attained by any species which has been studied and he has derived another formula to express the stem from which appears to be much more consistent with nature. It is hoped that these studies of form will be of use in studying the development of second growth stands and stimulated growth after partial cuttings, both of which problems are

complicated by changes in form which make existing volume tables of doubtful accuracy.

Last summer Professor Behre assisted by Harold White, '25, gathered considerable data upon the yield of second growth western yellow pine. This work will be continued this year and in addition a start will be made upon the problem of rate of growth and future yields of the material below merchantable size left after logging in the white pine type.

Results of Tree Planting in South Idaho

During the past summer Dean F. G. Miller made a trip through South Idaho to familiarize himself with the conditions for tree growth and the success attained by tree planting in the past in order to be able to better advise inquiring citizens on the kind of trees to plant in the various localities. The distribution of young trees for shade tree, windbreak and woodlot planting, carried on by the Idaho School of Forestry has attained considerable proportions and it now seems desirable to gather better information on the results to be anticipated. During the coming summer, therefore, Dean Miller will again visit south Idaho, studying methods of planting and measuring the growth of old plantations, many of which have now been growing long enough to show results.

During the past summer Mr. C. W. Watson, of the forest school faculty was a member of a grazing reconnaissance party on the Beaverhead National Forest, Montana. This summer he will be employed by the U. S. Forest Service on range investigations at the Great Basin Experiment Station, Ephraim, Utah. The experience Mr. Watson will gain in this way should be of considerable value in helping him build up the courses in grazing and range management here and in planning investigations he will undertake in South Idaho next year.

The American Forestry Association has recently organized an "Advisory Editorial Council" consisting of representatives from all sections of the country in order to make the editorial department of the "American Forestry" magazine more effective and more representative of important forestry developments for the entire country. Dean F. G. Miller of the Idaho School of Forestry has been selected to represent the states of Idaho and Montana upon this council.

FOREST PROTECTION WEEK

By F. G. MILLER, Dean

The fourth annual Forest Protection Week, April 22 to 28, was generally observed throughout the state. Besides the committee having general charge of the arrangements, committees on school program, speaking campaign, advertising, and the press were appointed, and each did splendid work.

The school program committee with Dr. Henry Schmitz as chairman, made an effort to reach every school in the state, both in the country and in the towns with an attractive sixteen page folder carrying the proclamations of President Harding and Governor Moore, and containing other material to assist in preparing suitable programs. Each folder was accompanied by a letter from Miss Elizabeth Russum, state superintendent of public instruction, urging upon each school the importance of a proper observance of the week to the end that the forests of the state might be saved from the ravages of fire. Reports from teachers and superintendents show that the suggested program was very generally used.

The folder, together with a strong letter summarizing the forestry situation in Idaho, written by Professor C. Edward Behre, chairman of the speakers' bureau, was also mailed out by the bureau to boy scout masters and executives, camp fire girls, American legion posts, commercial organizations, women's clubs, rotary clubs, elks clubs, kiwanian clubs, labor leaders and farm bureaus.

The speakers' bureau in cooperation with the Forest Service also organized an extensive speaking campaign, in which the objects and aims of Forest Protection Week as well as the relation of sustained forest industries to the permanent prosperity of the state were

generally presented by foresters and others to the above bodies as well as in the public schools.

Reports from about 50 speakers show them to have addressed over 100 organizations, with a total attendance of approximately 12,000. These meeting places represent every part of the state. Doubtless many other meetings were held that have not been reported. In at least one case, that of Mr. Franklin Girard of the Forest Service, the speakers address was broadcasted by radio.

Mr. A. D. Decker of the Potlatch Lumber Company, acted as chairman of the committee on advertising, and at the suggestion of this committee many of the business houses ran forest protection hits in their local advertising and exhibited appropriate window displays. At Orofino, Supervisor Paul A. Wohlen reports that a model of a forest fire and a picture collection were on display during the entire week and attracted wide attention. This committee also secured wide distribution of "forest aide" badges and wind shield stickers and furnished lantern slides to various theatres.

The papers of the state gave very general support to the work of the press committee, headed by Forest Supervisor C. K. McHarg, Jr. of Coeur d'Alene, all of them giving generous space to articles supplied by members of the committee and others. The press matter included many strong editorials.

Altogether it is believed that the people of Idaho were generally reached with the message of forest protection, the place of forestry in the industrial welfare of the state, and the importance of keeping the forest lands stocked with growing trees if our forest industries are to survive.

FORESTERS' ANNUAL BANQUET

The Seventh Annual Banquet of the Associated Foresters of the Idaho School of Forestry took place on the evening of March 14, 1923 at Lindley Hall. Sixty forestry students and their guests sat down to an excellent repast in a hall bedecked with evergreen bran-

ches and otherwise appropriately decorated.

Mr. C. W. Watson, Instructor in Forestry, acting as toastmaster added much interest to the program by his clever introductions and replies to the various speakers. The program included short talks by Professor C. E. Behre;

A. D. Decker, Land Agent of the Potlatch Lumber Co.; C. L. Butterfield; E. C. Shepard, Supervisor of the Boise National Forest; A. M. Sowder and J. W. Rodner, of the School of Forestry and Professor C. W. Chenoweth of the university faculty. These talks were interspersed with songs by the Sigma Alpha Epsilon quartet and selections by an instrumental trio consisting of violin, cello and piano.

President A. H. Upham and Senator M. E. Lewis, whose names appeared on the program, were unable to be present, the former being unexpectedly called out of town at the last minute and the latter being detained by business in South Idaho.

Professor Behre gave some amusing reminiscences of his work at the Yale School of Forestry, where he had first made the acquaintance of the toastmaster, Mr. Watson, and of one of the guests, Mr. Decker.

Mr. Decker traced the relationship between the lumber industry and the foresters of the country from the early days and stated that without question the lumber industry would be seeking the services of graduates of the forestry schools in increasing numbers to help work out the big problems of improved methods of logging and milling, utilization of by-products, putting cut-over lands to productive use and maintaining the supply of raw material for the future.

Mr. C. L. Butterfield, introduced as a pioneer in Moscow deeply interested in forestry matters, congratulated the foresters upon their choice of vocation and encouraged them in their work with the counsel that satisfaction with one's work was more to be desired than large material gain with its usual accompaniment of anxiety and care.

Forest Supervisor E. C. Shepard, who had been giving a series of lectures to students of the forest school for the past ten days amused his audience with anecdotes of his experience.

A. M. Sowder, president of the Associated Foresters, outlined the accomplishments of the organization during the year and called upon the students to continue to show their interest in forestry by supporting the club in the future.

J. W. Rodner, apologizing for failure to produce the "Squirrel Fodder" from the Hermit of Hemlock Butte, as scheduled on the program, related the incidents relative to his missing the third annual holdup of the Fernwood Poolhall last summer after having been relieved of his valuables in the two preceding events.

The last speaker of the evening was Professor C. W. Chenoweth, who has for several years spent his summers as smokechaser on the Clearwater National Forest and who last year made himself famous in forestry circles in the Northwest through his publication in "The Idaho Forester" of a humorous article entitled, "The Science of Smokechasing." Professor Chenoweth kept his audience in continual laughter following the story of his initial experience in forest protection work, in which some of those present had figured as his bosses.

At the close of the program everyone present felt that the banquet had been the most successful event of its kind in recent years and the committee in charge, composed of A. M. Sowder, J. W. Rodner, E. T. Nero and Leslie Eddy, deserve much praise and credit.

TIMBERBEAST HOEDOWN

The seventh annual dance of the Associated Foresters, known as the "Timberbeast Hoedown" was held in the University Gymnasium on December 16th and was a complete success. The men decided to discard the customary attire consisting of stag shirt, Malone trousers, and high topped boots and "busted forth" in "civies." Nevertheless the Timberbeasts were conspicuous when the "Timberbeasts Special" rolled around.

Several days before the dance a crew stormed the mountains and returned with several loads of evergreens which were used to trans-

form the cold bare walls of the gymnasium into huge mounds of green. The orchestra, which "put forth" a weird brand of syncopated jazz music, was secluded in a grove of fir trees in the center of the floor, above which beamed throughout the evening a splendid big silvery moon. Evergreen streamers were dropped from one side of the balcony to the other as well as along the edge.

The "Timberbeast's Special" was quite novel and will long be remembered by those who attended. The light was supplied by six camp fires and a flurry of snow descended throughout the dance.

XI SIGMA PI

Founded in 1908 and existing only as a local honor society for a period of seven years, on the University of Washington Campus, Xi Sigma Pi sprang into prominence and became a national honor society in 1915. Since that time, Xi Sigma Pi has grown steadily until at the present time five chapters have been established, reaching from the Pacific Coast to the Atlantic Coast.

Epsilon Chapter of Xi Sigma Pi was established at the University of Idaho in 1920. The membership of Xi Sigma Pi is rapidly increasing and for the near future one can predict an outlook as glowing as that of any other national honor society.

The objects of the fraternity are to secure and maintain a high standard of scholarship in forest education, to work for the upbuilding of the profession of forestry, and to promote fraternal relations among earnest workers engaged in forest activities. The idea of scholarship and leadership in forest activities has always been uppermost in the selection of members. To further the scholarship idea, the Epsilon Chapter has purchased a bronze scholarship tablet of beautiful and artistic design. Each year there will be engraved on this tablet the names of the students who

have attained the highest average in each class for the school year. The tablet will fill a long felt want in the School of Forestry to promote scholarship and, being permanent, will afford a new attraction to our halls.

As much weight is placed upon a man's practical ability, such as adaptability to forest work or lumbering, capacity for leadership, and promise of attainment, as is placed upon his scholastic work. By this means of grouping, and by stimulating the desire of the underclassmen for election to the fraternity, it is hoped that the objects of the fraternity may be attained.

To be eligible for membership, a student must have completed two and one-half years of standard college work in an approved School of Forestry, three-fourths of his grades shall have been above 80 percent, and he shall not have received any failures in forestry subjects. He shall also have shown creditable interest and activity in practical forestry work.

New members in Epsilon Chapter for the present year are: Rogers G. Wheaton, '24, transferred from Gamma Chapter, University of Maine; Arthur M. Sowder, '24; and Ralph Space, '24.

PERSONALS

C. E. Favre, M.S. (For.) '15, has been transferred from the Humboldt National Forest to the forest Supervisorship of the Wyoming-Bridger National Forest with headquarters at Kemmerer, Wyoming.

Virgil C. Moody, '17, is a district ranger on the Sawtooth National Forest and may be addressed, U. S. Forest Service, Ketchum, Idaho.

E. C. Réttig, '19, declined an offer of an instructorship in the University of British Columbia last fall in order to remain with the Clearwater Protective Association.

Oscar C. Munson, '21, is now in the Engineering department of the Southern Telephone Co. and his address is 823 S. Union Ave., Los Angeles, California.

Thomas B. Jackson, '19, emigrated from Idaho to California to accept an attractive offer as logging superintendent for the large yellow and sugar pine operations of the California Fruit Growers Supply Company, Susanville, Calif. Before leaving the Edward Rut-

ledge Timber Co., Jackson helped install the new incline railroad at Clarkia, having previously made a trip to the coast to study the various installations of inclines in that region.

Roscoe R. Davis, Ex. '23, has an appointment as Forest Ranger and may be reached through the U. S. Forest Service, Ogden, Utah.

William E. Buckingham, Ex. '22, now has charge of the Mussellshell district on the Clearwater National Forest.

J. P. Drissen, '21, writes from Kirkford, Oregon, where he has been engaged in timber sale administration on the Klamath Indian Reservation, that he will probably have charge of the fire situation on the reservation this summer.

C. R. Patrie, '22, will have charge of experimental eradication of wild currants in North Idaho this summer for the Office of White Pine Blister Rust Control.

James W. Farrell, '22, has been awarded the rank of Forest Examiner and is now stationed

at McCall, Idaho, headquarters of the Idaho National Forest. After his appointment as forest assistant last summer, Farrell was first assigned to the Wyoming-Bridger National Forest for timber sale work and then to the district office at Ogden, Utah, on management plans.

A. N. Cochrell, R. C. '21-'22, has been promoted to position of Fire Assistant of the Clearwater National Forest.

Robert Johanson, R. C. '20-'21, is now ranger in charge of the Cook Mountain district, Clearwater National Forest.

Frank A. Brown, '22, is now employed by the Edward Rutledge Timber Co. near Clarkia, Idaho.

P. D. Sharma, M.S. (For.) '22, returned to his home in India early this year, where he expects to practice his profession. All those who knew Sharma will be interested in the following excerpt from a letter to Dean Miller dated April 5 at Amritsar, Punjab, India:

"This letter I am writing from my home at Amritsar where I am encircled by all the members of my family. I had a wonderful trip on the return journey. My public speaking subject proved a first help at Vancouver, B. C. for I received a gold watch together with some cash in recognition of my three lectures delivered at Vancouver and in the vicinity among Indian Communities for the good of my country. Now there was nothing to fear as regards funds and I got to the Boat Empress of Australia on the 18th of January '23. This Boat I found to be an exceptionally good one and very comfortable. It provides with a nice swimming (bathing) tank, a theater on every other night and there are elevators (lifts) to the different stories of the Boat.

"The Sea was tolerably rough till we reached "Yokohama" (Japan) in 14 days. This seaport looked familiar to me yet my observations were rather different this time. The intensity of land utilization and skilful handling of Agriculture by the "Japs" was a great point of interest to me. At seaports the costs are way higher than inland. I prefer the business methods of America and am prepared to advise the Oriental world to copy U. S. A. methods. The prices are never fixed in whole of the Orient (exceptions are few in case of some good firms) including India, so a customer never knows whether he is robbed, paying little too much or just a due profit.

"Witnessed once more the dense population at Hongkong (China) on the 8th of February

'23. It is a wonderful national seaport. The great town on the hill side and the port and big hotel and office buildings at the foot make an excellent scene when there are lights at night. The streets are very active; very noisy with a row of coolies drawing two wheeled "Rickshaws" (rubber tired) and Chinese gentlemen taking their little packets of groceries or meat hanging in one of their hands. It looks clumsy in comparison to neat packing with paper in America. My stay was very very short here as by chance I got a good boat sailing out for Calcutta the next morning so I had to be very busy in order to be able to undertake another journey of nineteen days.

"I stayed at Calcutta for about eight days to do away with the tedium of Boat journey and visited my old friends there. Finally I reached my home town among a big crowd of relatives and friends from far and near who had all come to see me Americanized. "You look white and younger" were the first remarks made by my brethren.

"Young Sharma (my little son) has grown up and now seems a big boy. He asked me whether I had brought for him an American football, as I used to describe the American football game as played at the "U" so he was astonished to see the same kind of football which I had purchased at Calcutta for him. Instead of the game being played in a different manner, he was expecting a different shape in football.

"Though I do not want to close my letter so soon yet I do so simply for I do not want to take much of your precious time while in India we have all the time at our own disposal.

Very obediently yours,

(Signed) P. D. Sharma."

Harvey Ivan Melick, '23, completed his work at the close of the first semester and returned to his home at Nampa, Idaho, in February.

Russell M. Parsons, ex-'23, left school in March to accept a responsible position in connection with the new white pine logging operations of the E. T. Chapin Co. at Weippe, Idaho. He plans to complete his work for graduation next year.

Edwin W. Chamberlain, '25, was accepted for entrance into the U. S. Military Academy, West Point, N. Y. and accordingly withdrew from the University early in March.

George J. Madlinger, ex '24, returned to his home last fall and has been taking the course preparatory to forestry at Yale University this year.

Frank B. Folsom, Voc. '20-'22, was married last summer to Miss Ethelyn Nankervis of Moscow and is now a forest ranger on the Colville National Forest, Republic, Washington.

Norman F. Taylor, Voc. '20-'22, has also been in charge of a ranger district on the Colville National Forest, but it is reported that he may have to give it up because of his health.

Stanley Bartlett, R. C. '21-'22, has been employed by the U. S. Department of Agriculture on forest insect work in New Jersey, but expects to return to the Maine woods for the summer.

Paul Bieler, R. C. '21-'22, has been employed as a draftsman and map copyist in the office of engineering, U. S. Forest Service, Ogden, Utah.

Robert A. Miller, ex '22, is manager of the National Park Lumber Company's retail yard at Arco, Idaho.

A. S. Daniels, '23, has a very attractive position in the engineering department of the National Lumber & Creosoting Co. at Texarkana, Texas.

Paul Gerrard, '23, will resume his duties as Fire Assistant on the Clearwater National Forest immediately after completing his course this spring.

Edward T. Nero, '23, will also return to the Clearwater National Forest where he holds an appointment as ranger, after commencement. With Leslie Eddy, '24, who has also a ranger position, Nero will be engaged on special work with headquarters at Orofino.

The Clearwater National Forest will also take Fred Shaner, as assistant ranger for the Cook Mountain District, L. E. Spence (R. C.) for trail construction and Lewis Cummings, '25, Emera W. Renshaw, '25, Kester D. Flock, '26, and LeRoy W. Lewis, (R. C.), for protection work.

Cecil C. Ryan, '23, and Elva A. Snow, '24, are engaged for the summer on the work of White Pine Blister Rust Control which will this summer concentrate on eradication of black currants throughout the state.

Floyd W. Cossitt, '24, will return to his ranger district on the Selway National Forest for the summer.

Ralph Hand, R. C. '20-'22, is now in charge of the Lochsa district of the Selway National Forest.

Others going on the Selway for the summer are Howard A. Gatley, as assistant ranger and

Charles W. Hall, '26, and Wm. Pelinka, (R.C.) for protection work.

Ray S. Ferguson received an appointment as ranger on the Selway immediately upon completion of his vocational training here at Moscow.

Ralph Space, '24, will be a member of a party engaged in an extensive reconnaissance of the Selway National Forest this summer.

Jack W. Rodner, '24, is again with the Coeur d'Alene Timber Protective Association for the field season. This year he has charge of all the grazing work of the association.

Arthur M. Sowder, '24, plans to make a trip to the coast this summer to gain experience in the logging camps of that region.

Rodgers G. Wheaton, '24, and John H. Zuver, II, '25, will work with Professor C. E. Behre, upon mensuration and management studies of Western Yellow and White Pines this summer.

Don C. Fisher, '25, had to leave school in April in order to undergo a serious operation in which one of his kidneys was removed. He returned to Moscow recently but will probably have to drop forestry because of his physical condition.

Paul M. Harlan, '25, will spend the summer in the logging operations of the Potlatch Lumber Co. at Elk River, Idaho.

D. S. Man, '25, plans to spend the summer at Vancouver, B. C. where he has many acquaintances. He expects to work in a saw-mill there.

M. S. Melick, '25, who spent last summer on timber sale administration on the Washakie National Forest, Lander, Wyoming, will return to take up the same work this season.

Frank B. Moore, '25, has a job for the summer with the Hammond Lumber Co. at Eureka, California.

Henry Q. Nicol, '25, plans to do some "gyppo" logging for the Edward Rutledge Timber Co. at Clarkia, Idaho, this summer.

Harold Z. White, '25, had to drop out of school for the second semester for financial reasons and has since been employed by the Edward Rutledge Timber Co., Clarkia, Idaho.

Guy V. Williams, ex-'25, left school early in the year and has been working in the Barber Mill of the Boise-Payette Lumber Co.

Donald S. Coolbrath, '26, is engaged for the summer on the Kaniksu National Forest, Priest River, Idaho.

Warren H. Bolles, '26, has a job for the summer on the Payette National Forest.

William G. Guernsey, '26, and Neal D. Nel-

son, '26, will go to the Coeur d'Alene National Forest for summer work.

Clarence C. Olsen, '26, will attend the University summer session at Moscow.

Arch M. Sams, '26, will spend the summer with Dean Miller, studying growth and results of tree planting in South Idaho.

Joseph H. Hamel had to leave before the termination of his vocational training period because of poor health. He has been in the hospital at Walla Walla, Wash., and writes that his condition is improving.

L. H. Melchisedeck will take placement training on the Deschutes National Forest, Bend, Oregon, this summer.

Victor Runberg, became the proud father of

a fine pair of twins, a boy and a girl on May 11. He will be employed as a grader in the Hedlund Box and Lumber Co., Spokane, Wn., during the summer.

L. H. Garver (R. C.) has an appointment as district ranger on the Weiser National Forest at Indian Valley, Idaho.

William L. Kiser, (R. C.), and Frank Youngblood (R. C.) have jobs on the Boise National Forest.

France Reuterskiold, having completed his vocational training period, will be employed for the summer on the Oregon National Forest, District 6, at Cascade Locks, Oregon. He was married to Miss Bernice Burnham of Culdesac on May 26. Hearty congratulations.

ROSTER OF STUDENTS

The following is a list of students in actual attendance at the School of Forestry during the year 1922-23. The information after each name is in the following order: 1, name; 2, home address; 3, fraternity; 4, honorary fraternity; 5, scholastic achievements and athletics.

SENIORS

Baumann, Herman, Milwaukee, Wisconsin; Sigma Alpha Epsilon; Alpha Zeta; Xi Sigma Pi; President, Associated Foresters 1921-22; Business Manager, "Idaho Forester" 1923.

Daniels, Albert Stanley, Bay City, Michigan; Phi Gamma Delta; President Associated Foresters, 1919-20; Glee Club, 1921-22.

Gerrard, Paul H., Vancouver, Washington; Beta Theta Pi; Xi Sigma Pi; Alpha Zeta.

Melick, Harvey Ivan, Nampa, Idaho.

Nero, Edward T., Moscow, Idaho.

Parsons, Russell M., Moscow, Idaho; Beta Theta Pi; Xi Sigma Pi; Ass't Business Manager "Idaho Forester" 1922; Vice-President Associated Foresters, 1922-23; Editor "Idaho Forester" 1922-23.

Ryan, Cecil C., Moscow, Idaho; Kappa Sigma.

JUNIORS

Cossitt, Floyd Morgan, Weiser, Idaho; Elwetass; Xi Sigma Pi.

Eddy, Leslie Eugene, Moscow, Idaho; Business Manager, "Idaho Forester" 1922; Secretary-Treasurer Associated Foresters, 1922-23; Associate Editor "Idaho Forester" 1923; Baseball "I" 1922 and 1923.

Krim, Ben, Newark, New Jersey.

Rodner, Jack W., Moscow, Idaho; Sigma Alpha Epsilon; Vice-President Associated Foresters, 1921-22; Associate Editor "Idaho Forester" 1921-22 and 1922-23.

Snow, Elva A., Boise, Idaho; Kappa Sigma; Baseball "I" 1922 and 1923.

Sowder, Arthur M., Coeur d'Alene, Idaho; Sigma Alpha Epsilon; Xi Sigma Pi; President, Associated Foresters 1922-23; Track "I" 1923.

Space, Ralph, Weippe, Idaho; Xi Sigma Pi.

Wheaton, Rodgers Gainey, Springfield, Mass.; Sigma Nu; Xi Sigma Pi.

SOPHOMORES

Behre, Mrs. Vernice, Moscow, Idaho.

Chamberlain, Edwin William, Moscow, Idaho.

Cummings, Lewis, St. Petersburg, Florida.

Fisher, Don C., Grangeville, Idaho.

Fuller, Harry E., Emmett, Idaho.

Greene, Edwin G., Moscow, Idaho.

Gudmunson, Orin Sylvester, River Falls, Wisconsin; Phi Alpha Psi.

Harlan, Paul McLean, Jackson, Tennessee; Kappa Sigma; Alpha Zeta; Glee Club, 1922-23.

Kent, Howard A., Bonners Ferry, Idaho; Kappa Sigma.

Man, Dasaundha Singh, India.

Melick, Marshall S., Bethlehem, Pennsylvania. Glee Club 1921-22.

Moore, Frank B., Muscatine, Iowa; Phi Delta Theta.

Nicol, Henry Q., Moscow, Idaho; Elwetass.

Renshaw, Emera Wolfard, Kamiah, Idaho; Phi Gamma Delta.

White, Harold Z., Moscow, Idaho.
 Williams, Guy V., Boise, Idaho; Sigma Nu.
 Zuver, John H. Jr., South Bend, Indiana; Sigma Alpha Epsilon; "University Argonaut" staff 1923.

FRESHMEN

Bolles, Warren H., Little Valley, New York.
 Bucklin, Ted, Idaho Falls, Idaho; Beta Theta Pi.
 Callender, William C., Boise, Idaho.
 Callison, Norla, Kendrick, Idaho.
 Connors, John D., Prichard, Idaho; Sigma Nu.
 Coolbrath, Donald Stuart, Brimfield, Mass.
 Field, Walter D., Huston, Idaho; Phi Delta Theta.
 Flock, Kester D., Spokane, Washington; Beta Theta Pi.
 Gerhart, Carl William, Merrill, Wisconsin.
 Godden, Floyd, River Falls, Wisconsin.
 Guernsey, William Gano, Millbrook, New York; Phi Delta Theta.
 Hall, Charles Wesley, McMinnville, Oregon.
 Howard, Kenneth Clinton.
 Johnson, Richard D., Poughkeepsie, New York; Phi Delta Theta.
 Jungquist, Carl A., Pacific Junction, Iowa.
 Lansdon, William H., Boise, Idaho; Phi Delta Theta.
 Lawrence, H. Wayne, Jerome, Idaho.
 Lundburg, Wendell Stanley, Idaho Falls, Ida.
 Montroy, Edward H., Bryant, Washington.
 Nelson, Neal D., Heyburn, Idaho; Phi Alpha Psi.

Olcott, Kenneth Merle, Allegan, Michigan.
 Olsen, Clarence C., Seattle, Washington.
 Payne, Hanley H., Idaho Falls, Idaho; Beta Theta Pi.
 Sams, Arch Myron, Skamania, Washington.
 Thometz, Gene Joseph, Twin Falls, Idaho; Phi Delta Theta.
 Toole, Arlie, Marshfield, Oregon.

UNCLASSIFIED

Autrey, Lawrence, Hauser Ferry, Washington.
 Clark, George W., Tousey, Washington.
 Eby, Lester W., Walla Walla, Washington.
 Ferguson, Ray S., Clarkston, Washington.
 Gatley, Howard A., Washington, D. C.
 Hamel, Joseph Henry, Bremerton, Wash.
 Higgins, Howard H., Fredericktown, Ohio.
 Luby, Lawrence L., Idaho Falls, Idaho.
 Melchisedeck, L. H., Moscow, Idaho.
 Reuterskiold, France, Ft. Atkinson, Wisconsin.
 Runberg, Victor, Potlatch, Idaho.
 Shaner, Fred William, Asotin, Washington.
 Willey, Lewis Edwin, Thornton, Washington.

RANGERS

Braun, Otto, Burley, Idaho.
 Garner, Lawrence Henry, Midvale, Idaho.
 Kiser, William L., Weiser, Idaho.
 Knapp, Russell Manley, Moscow, Idaho.
 Lewis, LeRoy W., Weippe, Idaho.
 McKinney, Clark P., Salmon, Idaho.
 Pelinka, William, Chicago, Illinois.
 Spence, Liter Estill, Park Ridge, Illinois.
 Youngblood, Frank, Meridian, Idaho.

ALUMNI AND FORMER STUDENTS


The following list of alumni and former students is not complete. Additions and corrections of addresses given will be appreciated as we desire to keep a complete and accurate list of all former students.

Allen, Thomas William; Ex-'22.
 Anderson, Mark, Ex-'15, Provo, Utah; (Hotel Manager.)
 Ashton, Alan White, Ex-'22.
 Barger, Harold B., Ex-'17; Browning, Mont.
 Bartlett, Stanley Foss, (R. C.) '21-'22; Locke Mills, Maine.
 Bedwell, Jesse Leonard, '20 B. S. (For.); Council, Idaho. (Ranger, U. S. F. S., Caribou National Forest, Antelope, Idaho.)
 Berry, Waldo Lee, (R. C.) '15-'16; Post Falls, Idaho.
 Bieler, Paul, (R. C.) '21-'22; U. S. Forest Service, Ogden, Utah.

Brockman, Cecil C., Ex-'23; Bickelton, Wash.
 Brown, Frank A., '22 B. S. (For.); 308 State Street, Boise, Idaho.
 Buckingham, William E., Ex-'22; Gifford, Idaho; (Ranger, U. S. F. S., Orofino, Idaho).
 Burns, Robert Owen, Ex-'15; Payette, Idaho; 625 Hoymount, Fayelleville, N. C.
 Cable, Guy Burr, Ex-'22; Roberts, Idaho.
 Carlson, Oscar; '15 B. S. (For.), deceased.
 Chamberlain, Edwin William; Moscow, Idaho.
 Chamberlain, Cecil; Kendrick, Idaho.
 Chamberlin, Fred; Ex-'23; Coeur d'Alene, Ida.
 Chamberlin, Gail B.; Ex-'22; Coeur d'Alene, Idaho.
 Cochrell, Albert N.; (R. C.) '22; (Fire Assistant, U. S. F. S., Orofino, Idaho.)
 Cook, Jacob Miller; Ex-'20; Oberlin, Kansas.
 Cooper, Alfred; Ex-'20; Los Angeles, Cal.
 Core, Glenn R.; Ex-'23; Burley, Idaho.

- Cowan, Talmadge D.; (R. C.) '15-'16; (Ranger, U. S. F. S., Targhee National Forest, St. Anthony, Idaho.)
- Cross, Sidney W.; Ex-'23.
- Cunningham, Russell N.; '17, B. S. (For.); (U. S. F. S. Missoula, Mont.)
- Darnall, Glenn McClellan; Ex-'16; Payette, Idaho.
- Darrah, Lionel Leonard; (R. C.) '20-'21; Moscow, Idaho; (Farmer.)
- Dart, William Ellsworth; Ex-'20; Moscow, Idaho; (Farmer.)
- Daugherty, Charles Ira; Ex-'22; Challis, Ida.
- Davis, Roscoe Richard; Ex-'21; Star, Idaho; (Ranger, U. S. F. S. District 4.)
- Decker, Arlie Delos; '13; B. S. (For.); M. F. Yale University, '17; (Land Agent, Potlatch Lumber Co., Potlatch, Idaho.)
- Denning, Steward K.; Ex-'13; 3067 Bateman St., Berkeley, Calif.
- Dipple, Ralph; Ex-'14; (Dentist, Springfield, Oregon.)
- Dodge, Keith Allen, (R. C.) '15-'16; Challis, Idaho.
- Doyle, Ivan; Moscow, Idaho.
- Drissen, John Philip; '21, B. S. (For.); Harrison, Idaho; (U. S. Indian Service, Kirkford, Oregon.)
- Duncan, Robert; (R. C.) '16-'17.
- Edwards, Kenneth D.; Nampa, Idaho.
- Eldridge, Ferris Edwin; Ex-'18.
- Elhart, Carlton D.; Ex-'22; Caldwell, Idaho.
- Evans, Philip Smith; Ex-'20; Preston, Idaho.
- Farrell, James W.; '22, B. S. (For.); New Meadows, Idaho; (Forest Examiner, U. S. F. S., McCall, Idaho.)
- Favre, Clarence Eugene; '14 B. S. (For.); '15 M. S. (For.); (Supervisor, U. S. F. S., Wyoming-Pridger National Forest, Kemmerer, Wyoming.)
- Fenn, Lloyd Alfred; '11, B. S. (For.); Kooskia, Idaho; (Attorney at Law; Manager, "Kooskia Mountaineer".)
- Fields, Charles Carlos; Ex-'14.
- Flyg, Carl Jacob; (R. C.) '20-'21; Shelley, Idaho; (Farmer.)
- Folsom, Frank B.; (Voc.) '20-'22; Elizabethton, Tenn. (Ranger, U. S. F. S., Colville National Forest, Republic, Washington.)
- Gavin, C. H.; Ex-'23; Heise, Idaho.
- Gildea, Howard Cecil; Ex-'14; McMinnville, Oregon; (Lawyer.)
- Gilman, John Elmo; Ex-'19; Obsidian, Idaho, via Stanley.
- Griep, Kenneth; Ex-'20; Fruitland, Idaho.
- Hallcraft, Vernon Ralph; (R. C.) '20-'22; New Meadows, Idaho.
- Hamilton, William Howard; Ex-'22; Santa Paulo, California.
- Hammond, George M.; Ex-'20; Pocatello, Idaho; (Bowerman Lumber Co.)
- Haladay, Howard Wesley; Ex-'16; Deceased.
- Hand, Ralph L.; (R. C.) '20-'22; Ashville, New York. (Ranger, U. S. F. S., Kooskia, Idaho.)
- Hanzen, Maurice Henry; Ex-'20; Box 904, Kellogg, Idaho.
- Hart, Irving Warren; Ex-'22; Boise, Idaho.
- Haynes, Ralph M.; (R. C.) '16-'17; Emmett, Idaho.
- Headrick, Ralph Alonzo; (R. C.) '16-'17; Moscow, Idaho.
- Heard, Herman Claude; Ex-'13; Phoenix, Arizona; (County Agent.)
- Helfrich, Will Edward; Ex-'15.
- Herman, Charles Henry; '13 B. S. (For.); Enterprise, Oregon; (Manager East Oregon Lumber Co., Enterprise, Oregon.)
- Hillman, William P.; Ex-'13.
- Hockett, Robert Vestal; Ex-'13.
- Holbrook, Frank C.; Ex-'25; San Francisco, Calif.
- Humm, Howard M.; (R. C.) '20-'22; Colorado Springs, Colorado.
- Humphrey, Clyde Pearson; Ex-'17; Coeur d'Alene, Idaho; (State Highway Department).
- Huestis, Clarence; (R. C.) '16-'17; Council, Idaho.
- Jackson, Tom B.; '19 B. S. (For.); (Logging Superintendent, California Fruit Growers Supply Co., Susanville, California.)
- Jensen, Irving R.; (R. C.) '16-'17; Essex, Montana; (U. S. F. S.)
- Johanson, Robert; (R. C.) '20-'21; (Ranger, U. S. F. S., Orofino, Idaho.)
- Johnston, Herbert William; Ex-'17; U. S. Biological Survey, Unalakleet Alaska. (Range Investigations.)
- Joke, J. A.; (R. C.) '15-'16; Moscow, Idaho.
- Jones, Renaldo Vincent; Ex-'15; Albion, Idaho.
- Jones, William McKinley; Ex-'22; Nampa, Idaho.
- Kambridge, Antone J.; Ex-'16; Genesee, Idaho; (Farmer.)
- Keefe, Frank; Ex-'15.
- Kelly, Robert C.; (R. C.) '20-'22; Bradford, Pa.
- Keyes, George W.; Ex-'22; Challis, Idaho.
- King, Leonard Austin; (R. C.) '20-'21; Orofino, Idaho.
- Kingan, Fred; Ex-'22.
- Lommason, Thomas; Ex-'17; (Grazing Assistant, U. S. F. S. Ogden, Utah.)
- Lundstrum, F. J.; '11 B. S. (For.); 633 Shatto Place, Los Angeles, Cal.

- McMullin, George Leiby; Ex-'18; 251 Bush St., San Francisco, Cal. (Stationery Specialties.)
- McNett, Gail Jr.; Ex-'16; Rathdrum, Idaho.
- Madlinger, George J.; Ex-'24; Poughkeepsie, New York.
- Markham, Murl J.; Ex-'24; Grangeville, Ida.
- Martin, Ernest M.; (R. C.) '19-'20; Weiser, Idaho. (U. S. F. S.)
- Martin, Paul J.; Ex-'19; Old National Bank Bldg.; Spokane, Wash. (Insurance Business.)
- Maruska, Joseph, (R. C.) '20-'21; Sandpoint, Idaho; (Farmer.)
- Massey, Ivan M.; Ex-'23.
- May, Henry W.; (R. C.) '19-'20.
- Malmsten, Henry Elof; '17 B. S. (For.); (Grazing Examiner, U. S. F. S., Ephraim, Utah.)
- Maxwell, Ben C.; (R. C.) '22; Waynesville, N. C.
- Melzian, Wesley; (R. C.) '20-'21; Sleepy Eye, Montana; (Teacher.)
- Miller, Silas Warren; Ex-'22; Nampa, Idaho; (Real Estate.)
- Miller, Robert Adolph; Ex-'22; Twin Falls, Idaho. (Manager, National Park Lumber Co., Retail Yard, Arco, Idaho.)
- Miller, William Byron; '22 B. S. (For.); New Meadows, Idaho; (Grazing Assistant, U. S. F. S., Ogden, Utah.)
- Moody, Virgil Carlton; '17 B. S. (For.); (Ranger, U. S. F. S., Ketchum, Idaho.)
- Morris, Leo Francis; Ex-'16; Weiser, Idaho; (408 Savings & Loan Building, Spokane, Washington.)
- Morrison, Frank Bernard; Ex-'22; Barber, Idaho.
- Munson, Oscar C.; '21 B. S. (For.); Moscow, Idaho; (Southern Telephone Company, 923 S. Union Avenue, Los Angeles, California.)
- Myrick, E. H.; Ex-'17; (Supervisor, U. S. F. S., Lewis & Clark National Forest, Choteau, Montana).
- Newkirk, Edwin Ely; (R. C.) '16-'17; St. Louis, Mo.; (Railway Mail Clerk.)
- Nonini, Amerigo Louis; (R. C.) '16-'17; Mackay, Idaho.
- Oylear, Clarence H.; Ex-'22; Middleton, Ida.
- Parsons, Ralph Howard; Ex-'14; (District Ranger, U. S. F. S., Coeur d'Alene, Idaho.)
- Patrie, Carthon Roy; Plymouth, Wisconsin; (U. S. Bureau of Plant Industry, White Pine Blister Rust Control, Portland, Ore.)
- Pederson, Arthur R.; Ex-'22; Kootenai, Ida.
- Peterson, Raymond E.; Ex-'24; Moravia, Ida.
- Post, Claude H.; Ex-'22.
- Poynor, Neale E.; (R. C.) '21-'22; Council, Ida.
- Rae, Charles Arthur; Ex-'14; St. Maries, Ida.; (Dentist.)
- Ramsburg, G. F.; Ex-'23; Weston, Va.
- Redinger, Clyde Edison; Ex-'21; Adams Basin, New York.
- Rettig, Edwin Claire; '19 B. S. (For.); Orofino, Idaho; (Clearwater Timber Protective Association.)
- Roeder, Charles; (R. C.) '20-'21; Streator, Illinois.
- Ruckweed, Fred John; '17 B. S. (For.); Plymouth, Wisconsin; (Gettysburg Pub. Schools, Gettysburg, S. D.)
- Rudesill, Ralph M.; (R. C.) '20-'22; Bradford, Pa.
- Russell, Raymond, E.; Ex-'22.
- Rutledge, Walter T.; Ex-'16; Nyssa, Oregon.
- Salvin, Otis William; Ex-'19; Carmen, Idaho.
- Schofield, William Robert; '16 B. S. (For.); Chinook, Montana; (County Surveyor.)
- Schroeder, Bert H.; Ex-'16; Cottonwood, Ida.
- Shanner, William W.; Ex-'22.
- Sharma, Parmeshri Das; '22, M. S. (For.); Rajpura Street, Chaunk Passian, Amritsar, (Punjab), India.
- Shipman, Oroville, H.; (R. C.) '16-'17; Boise, Idaho.
- Sievers, Lawrence; (R. C.) '20-'21; Milwaukee, Wisconsin.
- Slavens, Erwin Howard; Ex-'20; Spokane, Washington.
- Smith, Harley Roscoe; Ex-'14.
- Staples, Howard W.; '20 B. S. (For.); Moscow, Idaho; (Yukon Gold Co., Murray, Ida.)
- Stevens, Arthur W.; '15 B. S. (For.); 1830 Sharp Ave., Spokane, Washington.
- Stillinger, Charles Roy; Special '19; (U. S. Bureau of Plant Industry, Moscow, Idaho.)
- Stone, Capt. Lawrence Fielding; Ex-'15; Commanding Officer, Arcadia Balloon School, Arcadia, Cal.
- Stoneman, J. Warren; Ex-'23; Rural, Hill-yard, Wash.
- Storms, Willard Sidney; Ex-'23; Rupert, Idaho; (Farmer.)
- Swan, Hugh Harris; Ex-'17; Sherbourne, N. Y.
- Taylor, Norman E.; (Voc.) '20-'22; Oroville, Wash. (Ranger, U. S. F. S., Colville National Forest, Republic, Washington).
- Teed, Ryle; Ex-'13; (Forest Examiner, U. S. F. S., Portland, Oregon.)
- Telford, Milton McKinley; Ex-'20; Coeur d'Alene, Idaho.
- Thornton, James A.; Ex-'12; Coeur d'Alene, Idaho; (Logger.)
- Throckmorton, Michael Reed; Ex-'24; Rupert, Idaho.
- Vick, Ernest Raymond; (R. C.) '19-'20; Wat-ford City, N. D.; (U. S. F. S., Luther, Mont-ana).



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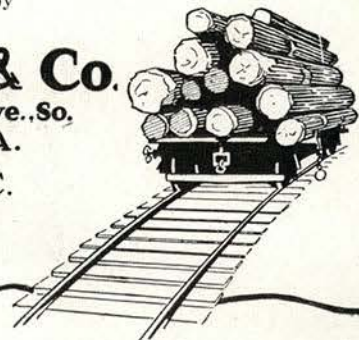
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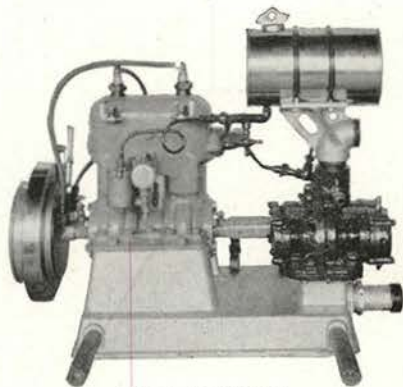
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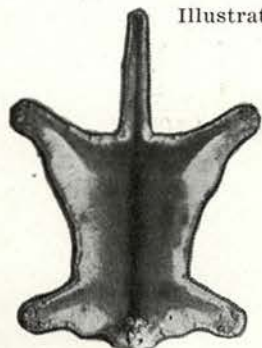
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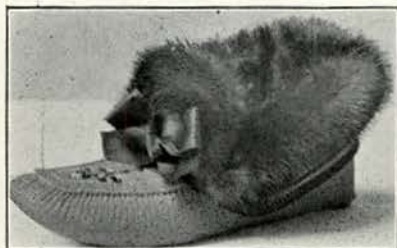
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H. B. Mickey, Sec. and Treas.

MOSCOW, IDAHO

(Continued from page 54)

- Wadsworth, Herbert A.; '11, B. S. (For.); Major U. S. Infantry, Fort Howard, Md.)
Walker, Everett Foster; Ex-'23; Moscow, Ida.
White, Albert C.; (R. C.) '19-'20; Boise, Idaho, R. F. D. No. 1.
Williamson, Charles Leonard; Ex-'14; (N. Western Mgr. for Powers Regulation Co., Chicago, 318 Alaska Bldg., Seattle, Wash.)
Webster, Roy Russell; (R. C.) '15-'16; Post Falls, Idaho; (Rubedew Lumber Co.).
Welker, Leonard; (R. C.) '20-'21; New Holstein, Wisconsin.
Wetherbee, Lawrence E.; Ex-'24; Chicago, Ill.
Williams, John; (R. C.) '16-'17.
Wiseman, Claude C.; Ex-'22; Middleton, Ida.
Wolfenden, William; Ex-'23; Gooding, Idaho.
Yates, Donald; '17 B. S. (For.); Potlatch, Idaho; (Land Department, Potlatch Lumber Co.).
Youngs, Homer Smith; '17 B. S. (For.); Deceased.

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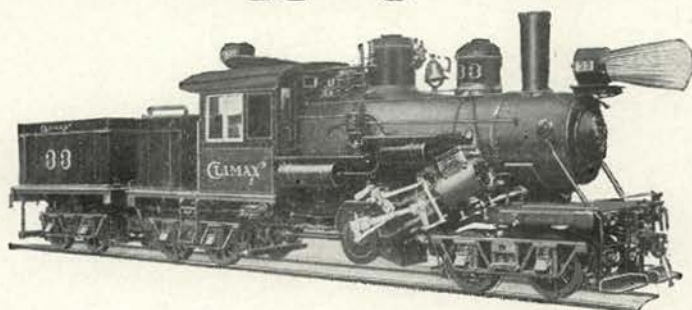
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Pacific Coast Branch of

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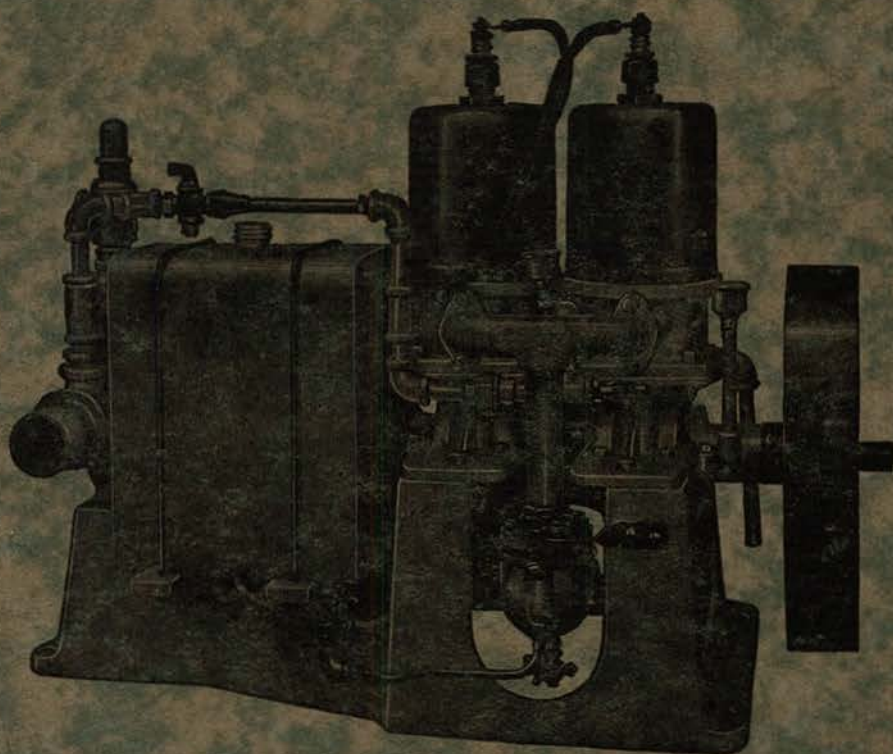
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Fairbanks-Morse Fire Pumping Outfit

SPECIFICATIONS

Two Cylinder Engine

4-5 H. P.	1200 R. P. M.
Capacities.....	20.....30 G. P. M.
Maximum Speed	1200 R. P. M.
Length over all	30"
Width	17"

Rotary Pump—Bronze

2" Suction, 1½" discharge.	
Capacity fuel tank.....	1 gallon
Pressures	80.....160 lbs.
Weight	109 lbs.
Height	21"

The pumps have proved their ability to throw water to a height of 172 feet. In a capacity test, water was pumped through 1,500 feet of 1½" hose to a height of 85 feet at the rate of 20 gallons per minute. Another test showed 20 gallons per minute against 180 feet head, through 800 feet of 1½" hose.

A large number of these outfits have been sold and are giving splendid service. This outfit is backed by a concern who have been building and designing engines and pumps for many years. Write for bulletin 701-A which gives full particulars.

Fairbanks-Morse & Co.

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