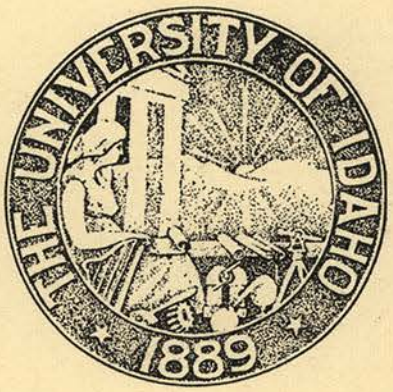
THE IDAHO
FORESTER

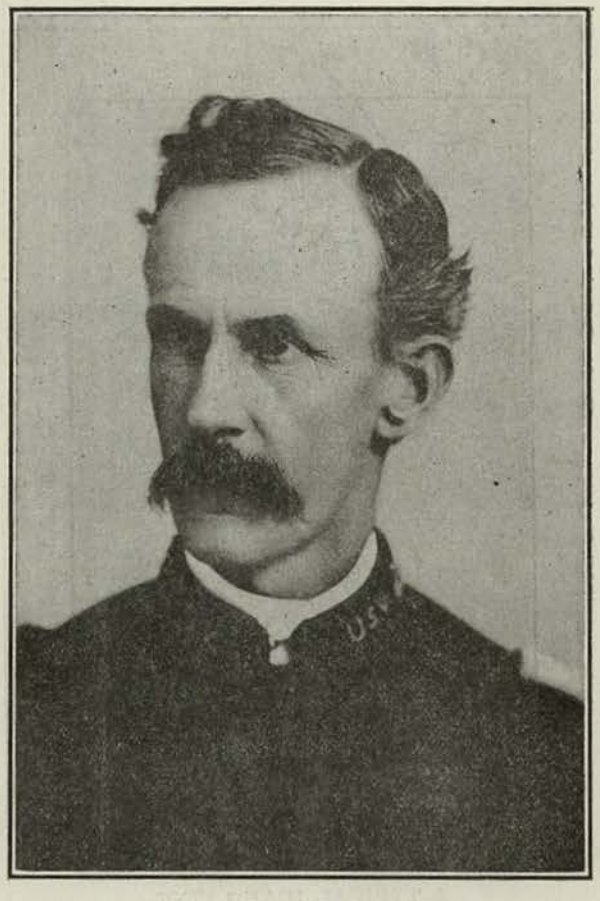


Forest Club
UNIVERSITY OF IDAHO
Moscow, Idaho
1920

The University of Idaho Forest Club Annual

A TYPICAL IDAHO PINE

UNIVERSITY OF IDAHO
Moscow, 1920



In appreciation of our friend, Major F. A. FENN, this Annual is affectionately dedicated.

The Idaho Forester

Published by the Associated Foresters, University of Idaho

Moscow, 1920.

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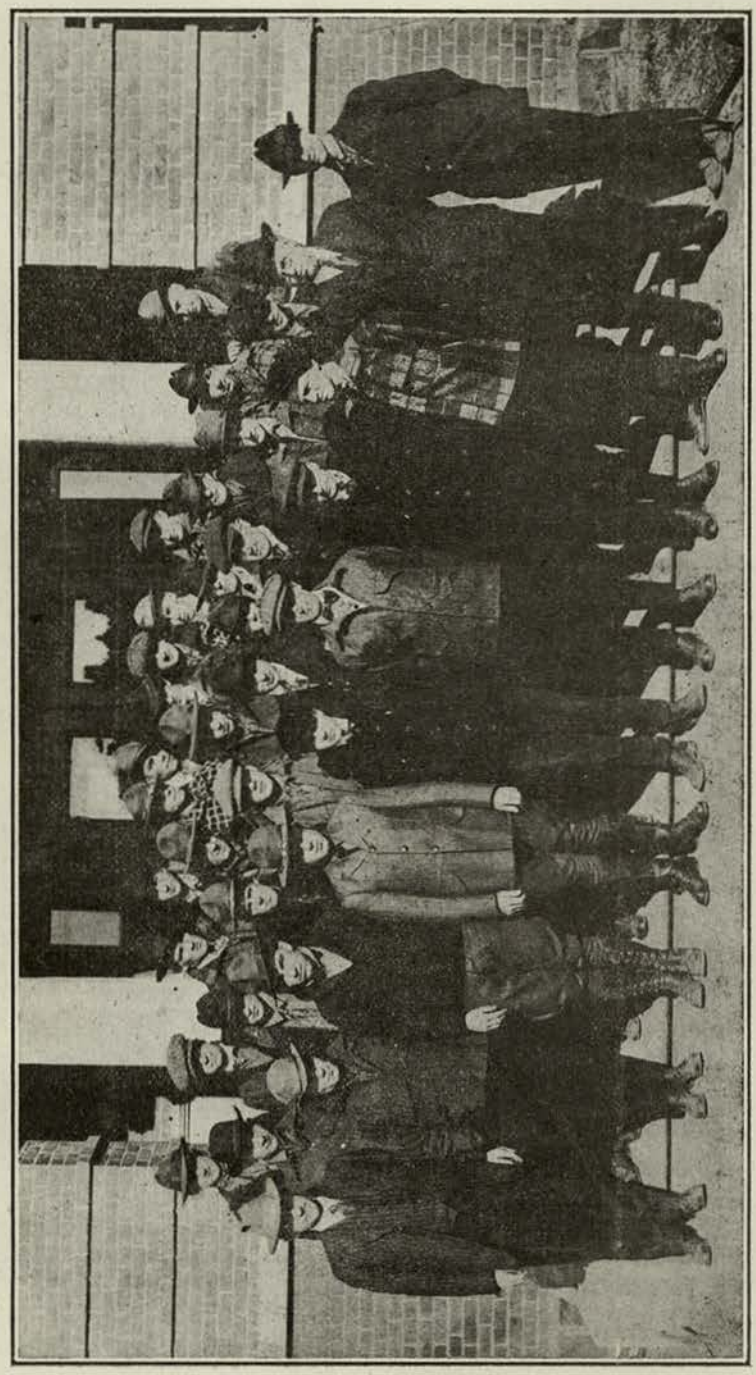

THE FOREST CLUB

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THE NEED OF A STATE FOREST POLICY FOR IDAHO*

By F. G. MILLER

The industrial prosperity of Idaho rests primarily on her agriculture, forestry, and mining, since the state aside from the lumber business is not an important manufacturing center. Of these three primary industries, forestry, if developed to a degree easily possible, will in the long run stand second in importance only to agriculture.

The state comprises 53,000,000 acres of land, and researches made by the Forest Service under the direction of Major D. T. Mason would indicate that of the total area, 23,000,000 or about 43% may be classed as forest land, of which 3,500,000 acres consist of barren or grazing land, lying at the higher altitudes; nearly 4,000,000 acres are permanent protection forests, occurring at the headwaters of irrigation projects, and therefore exerting an exceedingly important influence on stream flow and irrigation farming; approximately 1,000,000 acres are capable of profitable agriculture, leaving some 14,500,000 acres, which are better adapted to permanent timber production than to any other use. This vast area comprises one of the richest timber belts of the forest world, and under proper management, it will for all time insure to the state one of the greatest resources any state ever had.

In 1909, the lumber industry employed over 63% of the industrial population of the state, and the value of the manufactured timber products was about 59% of the value of all products manufactured in the state. The value of the output of lumber and timber products is now in excess of $60,000,000 annually. The total investment is around $40,000,000 in timber and $17,000,000 in logging and milling equipment.

The annual cut of lumber is now about 750,000,000 feet and is sure to increase rapidly within the next decade. The annual growth, tho now less than annual cut, is estimated at a possible billion feet, hence the industry could be increased by one-third and made permanent.

A redeeming feature of the situation is the fact that so large a proportion, nearly 90%, consist of National Forests, and plans to insure a continuous timber crop on these are well underway. These National Forests, therefore, as a source of the future timber supply, will stabilize the lumber industry, and in a large measure insure its perpetuity. However, any forest policy will prove inadequate, which does not include both state and private holdings, for while the federal government controls 90% of the forest area, it controls slightly more than one-half of the standing timber.

State Holdings.

The act providing for the admission of Idaho into the union, passed by Congress in November, 1889, made certain large grants of land to the state for the benefit of various state institutions as follows:

To the common schools, the 16th and 36th sections in each township or one-eighteenth of the total land area, amounting in round figures to nearly 3,000,000 acres.

To the state for the erection of public buildings at the state capital for legislative, executive and judicial purposes, 32,000 acres.

To the state university, 286,000 acres.

To the normal schools, 100,000 acres.

To the insane asylum at Blackfoot, 50,000 acres.

To the penitentiary at Boise, 50,000 acres.

To the other state, charitable, educational and penal and reformatory institutions, 150,000 acres.

These various grants were made to the state in trust to be managed by the state as trustee for the beneficiaries. The management is vested by the constitution in a state land board, consisting of the governor, attorney general, secretary of state, state auditor, and superintendent of public instruction. The admission bill prescribes the manner of disposing of these lands, fixes the minimum price at which they shall be sold, and further prescribes that the proceeds from all lands granted for educational purposes shall constitute a permanent school fund, the interest only of which shall be expended in the support of said schools.

A large amount of the timber on these grants, and more or less timber land itself has been sold, but these grants are still said to comprise upwards of 700,000 acres of timber lands, and according to Forest Service investigations, these lands are classified as

* A paper read before the Missoula Section of the Society of American Foresters at Missoula, Montana, April 26, 1920, by F. G. Miller, Dean of the School of Forestry, University of Idaho.

follows: barren or grazing land 25,000 acres; permanent protective forest, bearing unmerchantable timber 45,000 acres; unforested suited for planting 15,000 acres; young growth 85,000 acres; merchantable timber 325,000 acres; capable of agriculture 205,000 acres. leaving 425,000 acres as permanent timber producing land.

These timber grants are estimated to carry 10,000,000,000 board feet of merchantable timber, conservatively valued at $30,000,000. It is understood the timber area will be increased by at least 120,000 acres, when the state recovers its grant within the unsurveyed portions of the national forests by the exchange now being negotiated with the U. S. Forest Service, bringing the total left in the timber grant up to 820,000 acres of which at least 500,000 acres, after eliminating the barren and agricultural lands, would be adapted to permanent timber production. This is a splendid nucleus around which to build a permanent forest policy, which is one of the two logical courses now open to the state. The other is to dispose of the entire grant of both land and timber.

Should the State Dispose of Its Permanent Forest Lands?

It is argued by those who would dispose of the timber grant outright that this plan would result in a larger cash endowment, would give the state the benefit of the taxes on the property and would relieve the state of the burden of fire protection.

It will be admitted that the sale of both timber and the land would yield up a larger endowment by just the difference of the value of the land without the timber on it. This value for non-agricultural land would be small, and it is granted that only such land should be held for forestry purposes, that wherever the land is suitable for agriculture, it should eventually be cleared and put to this use. Only the non-agricultural land, therefore, is involved in this discussion. It is true that the land itself cannot be sold for less than $10.00 per acre, but non-agricultural land with the timber off will not move at this figure. If it sells at all, therefore, it will be with the timber, in which case the price of the timber itself will be reduced by the difference between $10.00 and the true value of the land. This true value, depending on situation as to altitude, accessibility, topography and soil conditions will vary widely, but the average is thot to be not far from $2.50 per acre. It will thus be seen that so far as the non-agricultural lands are concerned, the great bulk of the value, probably 95% of it, is in the timber and only 5% in the land itself. Therefore, by holding the land for successive crops, the state still gets 95% of the value of the grant as an endowment. If the land itself passes into private hands at $2.50 per acre and the money is loaned at 4% interest, which is probably about the average rate that may be expected, above the cost of administering the funds, then the state would realize an annual income of 10c per acre as interest, which of course would go to the beneficiaries of the grant, to which should be added the taxes, which would probably be another 5c, making a total of 15c per acre. But there is a strong probability that more or less of these non-agricultural lands in private hands would revert for taxes once the merchantable timber were off, and the state would then lose the taxes, in which case the income would be reduced to 10c per acre.

It will be of interest to compare this income with what might reasonably be expected, in case the state should hold the land for successive crops. Since the state does not have any investment in the land, and would not pay any taxes, there would be no expense for these two items. The only items of expense in holding such land for timber production, therefore, would be for restocking and protection.

Let it be assumed that the forest is one of white pine. In this case, natural reproduction may usually be depended upon, if the brush is properly disposed of after logging. The cost of brush disposal in the white pine type, according to Ellers Koch of the U. S. Forest Service will range from 5c to 25 c per M. for broad-cast slash burning to $1.00 per M. if the brush is piled and burned. Since a combination of the two methods could be used in most cases, it is thought that the average cost of brush disposal would not exceed $15.00 per acre.

The timber protective associations have spent an average of about 8c per acre annually for fire protection in North Idaho the past five years. The annual loss has been about 1% of the area protected. Fire protection, therefore, for this period, tho effective has not been ample. Mr. Koch believes, however, that an average annual expenditure of 15c per acre would give almost complete protection.

Assuming a rotation of 100 years and a compound interest rate of 3%, which would

be an exceptional earning for the state to make on a time basis of this length, the initial cost of $15.00 per acre for slash disposal in order to insure ample natural reproduction would at 3% compound interest amount in 100 years to $288.28. The 15c paid in annually would, at 3% amount to $91.09, making $379.37 as a total cost per acre of maturing the crop.

Forest Service yield tables would indicate that white pine may be expected to yield at least 60,000 board feet on a rotation of 100 years. A cost per acre of $379 and a yield of 60,000 board feet, would give $6.32 as the cost of growing white pine. In other words, if white pine stumpage is worth $6.32 in 100 years, the state would be making 3% compound interest on the investment. However, since white pine stumpage is now selling in Idaho at as much as $11.00 per thousand, it will be seen that the growing of white pine by the state is a very promising enterprise. Cost figures on the growing of larch, fir and yellow pine, while not so promising, indicate profitable returns.

But there are other and even more important reasons than the money income why the state should enter into the forestry enterprise, more particularly in a state like Idaho, where so much of the land is especially adapted to the growing of timber, and not to other crops. I refer to the matter of helping to perpetuate the great lumber industry which, as has been pointed out, plays such an important part in the economic life of the state, for by-and-large, next to agriculture itself, the forests of Idaho are the chief dependence of her people. Many of the cities and towns are almost solely dependent upon the lumber business. It has contributed tremendously to the settlement and development of the state, a contribution that must collapse if the industry passes out.

Relation of Forestry To Agriculture.

The farmer in a very vital sense is concerned in the problem of perpetuating the forest. Whether he constructs his buildings from wood or not, the price of his building material is governed largely by the quantity of lumber available. However, as a matter of fact, most farm buildings are constructed of wood. It furnishes the farmer with fuel, fencing material and farm repairs, and so he is interested to know that a timber supply at a reasonable price is assured.

Markets are directly dependant upon the population, and no market is so satisfactory as the home market. Sustained lumbering in Idaho means a sustained market for products from Idaho farms. To an unusual degree forest wealth is community wealth since 80% of the manufactured value of the tree is put into general circulation thru the purchase of labor and supplies. This is true no matter whether the timber is owned by the nation, the state, or the individual.

It will be of interest in this connection to note the importance of the woodlot to the farm. The U. S. census schedule of 1910 called for the value in detail of woodlot products sold or used on the farms in 1909. This schedule included firewood, fencing material, logs, railroad ties, telegraph and telephone poles, materials for barrels, bark or other forest products. A total of 4036 farms in Idaho, or a little over 13% of the farms in the state at that time, reported forest products used on the farms or sold in 1909 as having a total value of $1,280,512, or an average of $300 per farm. Undoubtedly the 1920 census will show a marked increase during the past decade.

Attention is called to the fact that the privately owned timber lands pay a large portion of the taxes. To this must be added the 35% of the gross earnings of the national forests for the support of the schools and the building of roads. The farmer is vitally interested in both.

The retention of timber on the water sheds is of the utmost importance to irrigation farming and water power development. There is also the problem of fostering the grazing industry which has come to have such a vital relation to forestery in Idaho.

The farmer must also have transportation for his products and is, therefore, interested in the construction and maintenance of railroads. The tonnage furnished by the average acre of forest land is not much less than that furnished by the average acre of farm land. The comparison is all the more significant when it is remembered that by forest land is meant land unsuited for agriculture.

Relation of Forestry to Mining.

While the consumption of wood for mining purposes in comparison with the total for all purposes is not large, yet a cheap supply of timber in the vicinity of the mines is in all cases important. That a scarcity of timber would limit the development of mining enterprises is without question unless the mines are rich enough to pay the added cost of transportation entailed in bringing the timber from

a distance. This is particularly true of the small mine owner and of the miner with little capital who wishes to develop promising prospects. The mining industry is therefore peculiarly interested in rational and effective methods of perpetuating the timber supply.

Mention has not been made yet of the influence of forests upon climate, erosion, and the aesthetics as well as the physical well being of the people. The fact is that some agency must practice forestry in Idaho or the economical and social progress of the state will be tremendously retarded.

Forestry Not Wholly a Federal Government Problem.

But the suggestion is made that forestry is essentially the function of the federal government and the state should therefore transfer its grants to the U. S. government. While the position has much in its favor, the writer does not accept this view. Altho admitting the difficulties of state control, he believes that these timber lands grants, in so far as the land is nonagricultural, should be administered permanently for the benefit of the educational, charitable and penal institutions to which they were granted.

The sentiment of the people for forestry in Idaho is crystalizing rapidly. A very important factor in bringing this sentiment about is the fact that the people are coming to appreciate that in their timber land grants they have something that is worth while. One of the reasons why it is believed that it would be unfortunate for the state to part with these grants is that the people at large would n a measure lose their interest in forestry in general. The university has a very deep personal interest in its timber lands, and it is believed that this is true of every other institution including the public schools. Moreover it is not believed that these beneficiaries would get the highest income from these grants by transferring them to the Federal Government. Anyway, the task of handling the forestry situation in Idaho is too great for even the U. S. Forest Service alone. It is handicapped for the funds necessary to administer the holdings it has, and at best it would be long years before it could take over all of these state grants. The federal government is now bearing and will continue to bear the lion's share of the burden. Private capital, I am convinced, will go as far as it dares, and the state must do its share. The task is so great and the problems involved so important that all agencies, government, state, municipalities, and private owners, must unite in their solution. All the forested states in the union have realized the importance of their forests, and have adopted some sort of a forest policy, Idaho being the one exception, tho an exceedingly important resource is at stake.

A Non-Partisan State Department of Forestry Needed.

In suggesting a state department of forestry no criticism of the present management of the state lands is intended, nor is any curtailment of the functions of the state land board implied. The need of a technical department to assist the board in the administration of the state timber lands is generally conceded and it is to meet this need that this recommendation is made.

With an estate approaching a million acres, carrying merchandise timber worth $30,000,000 the state should provide machinery which will properly administer it. No corporation with such a property would think of trying to manage it without adequate organization. Even if the state adopts the plan of selling the grant as rapidly as markets develop, there still would be need for such an organization for an indefinite time, since because the timber is inaccessible, it must be sold at a sacrifice or held till through development of transportation and better markets it shall come into its own. In other words, the state to realize to the best advantage on its holdings should sell gradually. It was, doubtless, this idea that the legislature had in mind in passing legislation restricting the acreage of state land that may be sold in any one year.

Long before sales are made, reconnaissance studies should be conducted which will enable the land board to know the amount, kind, and quality of the timber carried by the land, and to adopt some measures for its renewal when cut. The mineral, waterpower, and grazing resources of the land should also be known. Recreational features, if any should be determined—in a word, the entire property should be inventoried to determine its worth and possibilities.

In some cases, studies should be conducted to determine the effect of the removal of the forest on stream flow. With a body of information such as would result from these studies, the state would know the value of its holdings, and would be in an infinitely better position to make advantageous sales. The

state has established departments to foster agricultural and mining, why not for the encouragement of forestry which ministers so intimately to both?

Perhaps most of all just at this time is the need of a department to take charge of the fire problem. The work is highly technical and should be in the hands of a trained force. The writer has absolutely no sympathy with the idea that the state should dispose of its grant so as to escape the cost of fires. This plan ignores the fact that forests to an unusual degree are community property, and their protection, therefore, a community responsibility. This fact is recognized in the Week's law, under authority of which the federal government assists the states and individuals in the protection of their timber.

Reference has been made to the value of the woodlot, and it was seen that the income from them is even now a formidable sum in the aggregate. A state department of forestry could render the farmers a valuable service through the advice it could give them in handling these areas and marketing the products from them.

Private Holdings.

Owing to the length of time involved in producing a forest crop, the fire risk to be taken and charges to be carried in the way of interest, taxes, and protection, private capital is loath to engage in forestry. These conditions make the practice of forestry largely a function of the federal and state governments, and these agencies should, and doubtless will, gradually acquire ownership of an increasing proportion of the forest lands, tho this transfer of ownership will be many years in coming about.

The Fire Problem.

It is most fortunate that the forests of Idaho, almost everywhere in both the north and south part of the state would reproduce themselves readily and adequately following logging operations, if the brush burning were properly done, and subsequent fires were kept out. Even as it is a large part of the cut-over lands have reforested thru natural agencies.

The unfortunate part of the situation is that a large part of the reproduction has been destroyed by uncontrolled fires, since there is little or no attempt to protect the forest areas from fire, once the virgin timber is removed, even tho they have come into new forest. In fact, repeated fires on cut-over lands in many cases are encouraged in the belief that such treatment will aid in protecting the remaining virgin timber.

As an encouragement to private owners to so handle their timber lands at time of cutting and immediately after as to secure forest renewal, and subsequently to protect the new growth from fire, it is proposed that the state and federal government each contribute 25% of the cost of fire protection to private owners, the cooperative plan to cover both virgin timber and new growth. Such a plan would undoubtedly act as a positive stimulus to plans for forest renewal on the part of the private owner. Support for fire protection should under this plan be made mandatory on the part of all owners of timber land, whether large or small, as is the case now in the state of Washington.

Taxation of Cut-Over Land.

As still another encouragement to private initiative in the matter of securing forest renewal and to enable it to go further than would otherwise be possible, it is commonly proposed to lay an annual tax on the land, and exempt the growing timber from taxation till cut, the tax then to be based on a certain percentage of the stumpage value. This paper takes the position that it would be in the interests of the state to go a step farther in granting relief to the holders of cut-over land for successive crops of timber by exempting both the land and the timber from taxation till the timber is cut, the accumulated tax against both the land and the timber then to be levied against the timber. Please remember that I am now referring to taxation of cut-over land that is being held for a second crop and not to taxation of the present merchantable timber crop. The latter question is open to debate, but a discussion of it is beyond the scope of this paper.

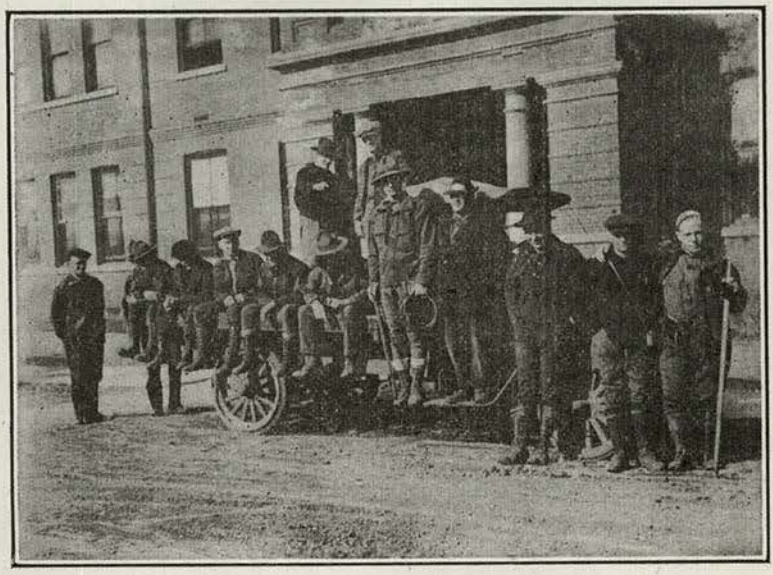
On the present basis of assessing timber land, taxes constitute a burdensome proportion of the total cost of growing timber. This proportion varies tremendously with the species, yield, rate of interest, etc., but commonly runs from 20% to 30%. So large a proportion of the cost falling due annually on a crop which matures only on a long time basis is certain to have a discouraging effect on private initiative in the matter of growing tmber. This is still the more apparent when it is remembered that however effectively

the growing crop may be guarded against fire, the owner always takes a chance of having it burn before it matures. This is a risk the public should share as it would do under a yield tax system, wherein the tax would be deferred till the timber is cut. There is not in this proposal any intent to release the owner from paying a just and fair proportion of the taxes, but it relieves him from payment till he harvests his crop.

With the relief both as to fire costs and taxes proposed, the cut-over acreage now in forest would be substantially increased.

At best, however, private capital cannot be expected to play any very large part in the growing of timber in Idaho under present economic conditions. As pointed out, however, it is now in possession of a certain amount of land bearing young timber and the public can well afford to and should bring about the remedial legislation proposed so as to encourage such enterprises just as far as possible. With slight extra expense in logging the area now in new crop could be greatly increased.

That economic conditions are already changing for the better is shown by the recent sale of white fir to the Spokane paper mills by one of the large lumber companies, a species which till now had a negative value. As the pulp industry grows in the Inland Empire, as it is sure to do, thus making possible a comparatively short rotation for species adapted to this use, or as markets develop for other small material, private forestry will receive added impetus.



OFF FOR THE FIELD

THE FOREST CLUB

In the beginning, the Forest Club was purely a defensive organization whereby timber-beasts could rally their forces to withstand the attacks of roving bands of muckers, lawyers, ags, and other outlaws.

In those good old days, so we are told, whenever the alarm was sounded, the timber beasts gathered in their stronghold, armed with broad-axes, peavies, pikes and spuds, and were always victorious in their encounters with the enemy, not only by reason of superior fighting equipment, but by their daring and strategy as well, thus even winning the admiration and respect of their adversaries. With the overthrow of these powerful enemies, the timber beasts soon found that life held very little excitement, and that something had to be done to relieve the monotony.

As they had always been of a more progressive temperament than their neighbors they decided to turn the time, which had heretofore been spent in fighting and riotous living into something of a more aesthetic nature.

So the present Forest Club was organized, somewhere back in the misty days "avant la

guerre," just when, even the most exalted of the senior class has forgotten.

The constitution, by-laws, and all records have since disappeared. (It is supposed that some member of the senior class used them to help win a commission, or destroyed them to obliterate all trace of some hienous crime. Neverthless two years diligient search has failed to unearth them.

The present club consists of a president, whose duty is to introduce the speaker, and say, "The motion is carried;" a vice president whose chief duty is to be always A. W. O. L.; a secretary and treasurer, who calls the roll and juggles the account books; the Dean of Forestry who O. K.'s or N. G.'s all A. W. O. L.'s from seminars; all other professors, instructors, timber beasts and forestry students enrolled in the U. of I., except a few Ags., who are trying to break into notoriety by taking Farm Forestry.

The club meets regularly every Monday at 4 p. m., when all business and occurrences of the forestry department are discussed, as well as other current events.

Once each month a social meeting or smoker is held and prizes usually awarded for the best bear or fish stories, after which eats are served.

The club has been very fortunate in procuring for addresses some of the most prominent men in the timber business and the profession of forestry, thus bringing to us first-hand important views of all departments of the forestry industry.

These lectures covered every department thoroughly and gave the students a very clear conception of what is to be expected of them when schooling is finished.

Of the clubs activities, the annual banquet was by far the most important fete of the year, not only because of the very interesting talks by the leading forestry men of the Northwest, and the "At-home" spirit that every guest felt and enjoyed, but "Man! you should 'a' seen those eats!"

Scarcely less in importance was the Timberbeasts' Hoe Down, given May 15th.

The term of 1919-20 has been by far the most successful year in the history of the club. Of course it is with reluctance that we give Danny credit for its success, but we know of no one else to blame for it so we hand it to him.

Among the numerous things planned for the coming year, is another officer for the club, namely an auditor, whose duty will be to inspect the club's books and records once a month, but the club has kindly consented to let this year's records go unquestioned.

Pres. Albert S. Daniels informs us that arrangements are being made for extensive illustrated lectures, and large forestry exhibits for the coming year, and everything points to a large enrollment and a very successful term for 1920-21.

The following men addressed the club during the year 1919-20:

Oct. 5, Prof C. Edward Behre, "Forestry in France."

Oct. 12, Dean F. G. Miller, "The Pacific Logging Congress."

Nov. 17, Mr. Donald Yates of the Potlatch Lumber Co., "The Application of a Training in Forestry to the Lumber Business."

Nov. 24, Prof V. H. Young, "The Forest Conditions of the Philippines."

Dec. 7, Dr. Henry Schmitz, "The Present Trend of Forest Pathology."

Dec. 14, President E. H. Lindley.

Jan. 19-24, Supervisor C. E. Favre of the Humbolt National Forest gave a series of lectures on grazing.

Feb. 24, Supervisor S. V. Fullaway of the Nez Perce National Forest, "Administration of the National Forests."

May 1-5, Supervisor M. H. Wolff of the Coeur d'Alene National Forest gave a series of lectures on "Forest Service Timber Sales," and "Fire Protection."

April 8, Mr. E. J. Hanzlik, Forest assistant, Dist. 6, spoke on the subject of "Working Plans.'

April 15, Prof. D. C. Livingston, "The Geology of Idaho."

April 22, Mr. R. A. Muttkowski, "Forest Entomology."

May 3, Mr. W. D. Humiston of the Potlatch Lumber Co.

May 12, Major F. A. Fenn.

SAYINGS AROUND THE SCHOOL OF FORESTRY

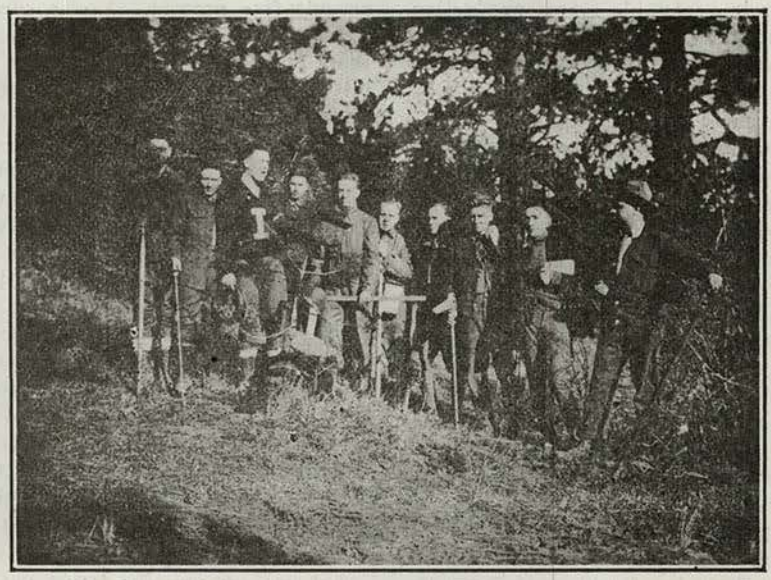
"Now we'll take this here datter."

"We give a d—n."

"Now, let me see. Uh huh. uh huh, we-e-ll. now we'll go at that in just this way."

"Eh, Eh, got a hurry-up in chem. today, Eh, heh, eh, heh."

"Har yu! Har yu!"



IN THE FIELD

THE PRESENT TREND OF FOREST PATHOLOGY *

Dr. Henry Schmitz.

It is clearly evident to those who have been following recent plant pathological literature that general plant pathology is being more or less subdivided into various special fields depending on the nature of the host. Thus there is found a distinct literature dealing with the pathology of the grains, truck crops, fruit trees, forest trees and others. These various subdivisions of general pathology are quite distinct and have problems peculiar to themselves. The diseases of forest trees or forest pathology is not the least important of these nor the least specialized in its application, and it is the purpose of the present paper to briefly discuss the present trend of this line of investigation.

In its narrowest sense, forest pathology might include only the diseases of forest trees caused by fungi. A little wider interpretation would include the consideration of physiological troubles such as leaf curl, chlorosis, injures caused by adverse conditions, etc. This latter type of injury may, at times, be equally as important as the former and there is no reason why it should not be included in the consideration of forest tree diseases. However, whatever may be the individual opinion as to the scope of the work dealing with the diseases of living trees, there can be no question that the forest pathologist should be equally familiar with the causes of decay in lumber, ties, mine props and in fact all forms of manufactured wood products, as he is with the actual diseases of the tree. The decay of lumber is yearly receiving more and more attention and will continue to do so with the steady increase in lumber prices. Thus it may be said that forest pathology may be divided into two parts. First, that phrase of the subject dealing with the diseases of the living tree and secondly, that phase dealing with the decay of wood products and in fact the decay of standing trees after they have been killed by fire or other causes. These two divisions of the general field will be considered in more detail.

In considering the diseases of forest trees as compared with the diseases of other crops, a great number of new conditions are introduced due to the commercial value of the crop and the rather unusual method of its production. Here the fact that it takes but one year for the average agricultural crop to mature whereas it takes some eighty to one hundred years for a forest crop to mature is referred to. This, of course, introduces the consideration of interest which is the all im-

* Abstract of a paper presented to the Associated Foresters, School of Forestry, University of Idaho.

portant factor in profitable forest production. It is the relation between forest pathology and points such as this which is being more and more emphasized.

In a recent paper, Meinecke has very properly said, "Forestry is not interest primarily in the morphology and life history of a given heartwood destroying fungus. Such studies tho indispensible and of the highest value, belong to an altogether different realm of science. The forester thinks in terms of trees, not of fungi; he cencentrates on timber species to be utilized, not on parasitic organisims, however interesting they may be from a mycological point of view. In forest pathology is ever to be of any value to practical forestry, all conclusions must be focused on the tree as a producer of timber values and as a member of the forest community."

This brief paragraph, so aptly put, includes in essence and in fact all that which is to follow, namely that in forest pathology the tree as of actual money value and not the fungus is of primary importance. It is hoped that the following brief discussion showing the relation of forest pathology to the care and cultivation of the forest will bring out this point.

It has also recently been pointed out by Meinecke that "Before forest pathology can have any far-reaching practical application, it will be necessary to have forest disease surveys made of all our National Forests. These may be made either as separate pathological surveys or in conjunction with the usual timber surveys. The latter is perhaps by far the more feasible since the topographer, if properly trained and experienced, can, while sketching in the type lines and indicating the class divisions, at the same time indicate the boundaries of the heavier disease infections and also pencil in the cull percentages. In this way, a pathological map, quite similar to a type map, soil map, etc., can be secured for the area surveyed, and along with complete notes of the estimator upon the diseased areas and upon data secured by means of a few sample plats a very close estimate of the cull percentage to be expected can be had."

It may be asked, "What is the value of such a pathological manp?" Personally, I believe that general reconnaissance is of comparatively little value without it. I have seen thirty percent and even fifty percent deducted for defect when the estimator had no more idea as to whether the defect was ten or seventy-five percent. Under such conditions, a twenty-percent cruise is of no more value than a 2½ per cent cruise and in fact the latter may, by chance depending upon the cruiser's choice of the amount of defect, be the more accurate. A proper consideration of defect is a most important consideration in government timber sales and purchases. A sale contractor figuring possibly on a conservative margin and accepting the estimate at its face value may find upon cutting the stand that a great deal more rot is encountered than was expected. This fact alone could easily account in the logging operation turning out at a loss instead of a profit, especially if the logging chance is not a favorable one. Such failures doubtless do not encourage the undertaking or further contracts, and fewer timber sales are the result. This has its ultimate effect on the forest as a whole in an economic way.

Let us now consider forest pathology in its relation to forest management. It is essentially the aim of forest management to maintain and develop a profitable forest business. As usually considered, forest management is more or less arbitrarily divided into two branches, forest regulation and forest administration. Administration is merely the carrying out of the plans formulated in regulation, and thus it becomes more specifically a question of the relation of forest pathology to forest regulation.

It is well known that in a mature or maturing forest the growing stock may be decreased due to death and decay of some of the trees. It is easily conceivable how a twenty to fifty percent decrease in the expected yield may change an otherwise profitable forest business to a financial failure. As has been said, we must think in terms of trees in forest pathology and not in terms of the destructive fungus. For example, Long has recently shown that western yellow pine is subject to a red heart rot in New Mexico and Arizona caused by a fungus which he tentatively refers to as **Polyporus ellisianus.** From the standpoint of the forest pathologist, unlike that of the mycologist, it is not the fact that **P. ellisianus** causes a red heart rot of **Pinus ponderosa.** From his point of view, it is immaterial (important as it may be to the science as a whole) whether this heart rot is caused by **P. ellisianus** or **Trametes pini,** which is the cause of the red rot of the same pine in this region. The all important point of interest to the forester, as responsible for

the management of a forest where this fungus is present, is the fact that the disease is not serious as long as the pine is in the black jack stage or in other words while it is under from 125 to 150 years. Knowing this fact enables him to limit his sales to the yellow pine stage and to take the more mature trees. Under actual forest management, 125 to 150 years might also limit the rotation period. Another important point brought out in this paper is the influence of site on the amount of rot. Thus it becomes a matter of the proper selection of species on sites unfavorable to western yellow pine in regard to the red heart rot.

Quite similar, from the standpoint of management, to a consideration of a decrease in the growing stock would be a consideration of a decrease in increment. For example, if under management 80 years were the best rotation from the financial point of view, it is clearly evident what a decrease in the calculated increment would mean. That is, suppose that it took 90 years for the tree to attain the size that it ought to have attained in 80 years. With interest say at 7 percent, this would more than double the cost of production, and hence would mean financial loss. Again, referring to a concrete example, it has been shown that the increment in some cases may be reduced fifty percent by the well known false mistletoe and also by various species of rust seriously affecting the leaf area. It is absolutely essential for the forester to know these points in the proper selection of species.

Another factor which would be of little concern to the general pathologist but of great interest to the forester is the relation of fungi to windfall. A careful study of this matter has been made by Hubert and he has shown the effect of various heart rot fungi in snags to the amount of windfall. The increase in the amount of windfall to the increase in the fire risk is so well known to you all that no further discussion on this point is needed.

The decay of slashing is also of great interest to the forester even if it may not be considered under general pathology. This matter has been investigated by Long, who has shown the effect of piling on the rate of decay in slashings in Arkansas. Investigations such as these should be carried on in all of our forested regions, so that the proper method of piling can be followed where the expense of burning must be eliminated. Investigations such as these come entirely within the scope of work of the forest pathologist.

There are many relations, such as sanitation, danger of epidemics, etc., to forest pathology which might be discussed, but due to the lack of time must be omitted. Recapitulating then, we may say that forest pathology may at times determine the priority of cutting whether applied to area, volume, or increment methods.

Let us now turn our attention to some of the more important relations of forest pathology to silviculture. First let us consider the diseases of seedlings so common in the nursery. Seedling diseases are caused by a host of fungi as **Pythium de baryanum, Fusarium, Phoma** and others. These diseases in themselves are very important yet relatively unimportant from the viewpoint of the forester. What I wish to illustrate is merely this: When seedlings are destroyed by an attack of fungi, the loss is merely the original cost plus one or two years interest. This is quite different from having the trees killed by fungi in the thirtieth or fortieth year when one considers interest charges as the forester must. I hope I make this point clear that we may have two diseases equally important as diseases, but when considered from the foresters point of view, one of them may be comparatively unimportant as compared with the other.

Another illustration may make this point a little clearer. I refer for the moment to two almost equally destructive diseases—the white pine blister rust on the one hand and to the common rust on lodgepole **(Cronartium coleosporoides)** on the other. Both cause similar injury to their respective hosts and yet are they equally important? By all means, no. And why? Because we are interested primarily in the tree and not the fungus. Lodgepole pine is comparatively unimportant as a forest tree compared to white pine and hence one disease is most important while the other only comparatively so. Is the point clear—in forest pathology the value of the host and the nature of the injury should determine the importance of the disease.

The general pathological condition of the forest may also influence the amount and nature of thinning. It has been found that in India **Cedrus deodar,** if not sufficiently thinned will become infected with a serious leaf fungus. This, however, can easily be controlled by proper thinning.

Grazing may also be quite important with the control of certain diseases of forest trees. I refer here to the rusts in general which have their alternate stage on herbacious plants. Take, for example, the lodgepole pine rust (**Cronartium coleosporoides**) which has its alternate stage on Castillega. Grazing keeps these plants down to a minimum but where grazing is not common, the plant is found in large numbers and thus the pine is predisposed to infection.

Tree diseases may also have an influence on the type of regeneration used and other silvical procedures, but the time is too short to discuss these in detail.

So also is there a relation between forest tree diseases and forest utilization. Considered from the standpoint of utilization, equally important diseases pathologically may be of entirely different importance.

For example, let us consider the case of the chestnut blight (**Endothia parasitica**) and the straw colored heartwood rot caused by **Polyporous frondosus**. Pathologically, **Endothia parasitica** is by far the most important disease of the chestnut and has practically wiped out its host in many of the eastern states and millions of dollars have been spent in its eradication and control. On the other hand, straw colored heartwood rot is hardly ever heard of. Yet considered from the standpoint of utilization (not from the point of view of silviculture, however,) straw colored heartwood rot is by far the more important disease, tree for tree. And why? The answer is simple. The chestnut blight fungus kills the tree, to be sure, but in no way injures the wood of the merchantable trees, nor is there any danger of secondary infection from this fungus after the wood has been manufactured into various products. Thus, trees killed by the chestnut blight fungus are in no way impaired—only the bark and the cambium are killed—and the wood can be utilized. Trees infected with the heartwood rot are on the other hand of little or no value from the standpoint of utilization. Therefore, I say the importance of the diseases of forest trees varies with the point of view taken, as for example, management or utilization. Points such as these are usually not emphasized in ordinary pathological considerations. Another illustration on a similar point. A brown heartwood rot and a white heartwood rot may be of equal importance pathologically, of equal importance in decreasing the value of the tree as far as manufactured lumber is concerned, but when the tree is considered for paper making purposes, the brown rot is important and the white rot not only may be unimportant, but may be considered as an advantage. The reason is briefly this: brown rots are caused by fungi which dissolve out the cellulose from the wood and leave the lignin. White rots on the other hand are caused by fungi which dissolve out the lignin and leave the cellulose. Cellulose is the important compound used in paper making and it is seen that in the one case it is absent and in the other case the amount present is increased.

We shall now consider the second subdivision of forest pathology, namely the decay of lumber and dimension timbers. This phase of the work is unmistakably in the field of the foresters. In a certain sense, it is not pathology at all since it does not deal with living trees, but rather with their products. Considering the value of manufactured lumber destroyed by fungi annually, it is most important. The decay of railroad ties alone each year amounts to many millions of dollars. The annual losses due to decay of stored lumber in lumber yards also runs up to the hundreds of thousands of dollars.

Perhaps one of the most important things for the forest pathologist with regards to this phase of the work is the ability to recognize incipient decay, that is the very beginnings of decay. Only too often is apparently sound lumber for building and construction purposes been infected thru improper storage in the lumber yards.

If conditions for decay are at all favorable, such infected lumber may not last over four to five years and heavy losses may result.

It is almost equally important that the forest pathologist should know the relation of certain properties of woods toward decay or resistance to decay. That is, he should know what influence the specific gravity of a wood has on its resistance to decay, the influence of resin, the influence of relative amounts of spring and summer woods, moisture content and a host of other factors. Information of this sort may often be very much to the point. For example, not many years ago specifications for timbers used in the factories and textile industries were drawn up. Among certain other points was a specification requiring a certain minimum resin content. The resin content of many pines fell below this minimum requirement

and hence these species were discriminated against. It then remained for the forest pathologist to show that small variations in the resin content within certain limits had no effect on the durability of wood and the above specification was withdrawn. Cases like this illustrate how profoundly practical pure science may be.

Let us next take up the matter of timber preservation. If one examines a list, such as Humphrey and Flemming have compiled, of substances toxic to the growth of fungi, it will be seen that a great number and variety of substances and compounds are toxic to fungi. The proper interpretation of such a table necessitates a knowledge of the uses of wood that the ordinary pathologist may not have. For example, in the table just cited, it is recorded that copper sulphate is toxic to wood destroying fungi at a concentration of under 1%. Zinc chloride on the other hand is toxic at a concentration of from 1% to 2%. That is, zinc chloride is less toxic than copper sulphate. Zinc chloride is also more expensive than copper sulphate and yet zinc chloride is far more widely used than is copper sulphate. And why? The answer is found in the utilization of the treated product. Copper sulphate has a very corrosive action on iron and metals and hence nails, railroad spikes, etc., are soon dissolved when driven into timbers treated with $CuSO_4$. Similarly let us compare either of the above salts with coal tar creosote. The cost of treatment of timber with coal tar creosote is far above the cost of treatment with either ZnC_l or $CuSO_4$, and yet coal tar creosote is by far the most extensively used preservative. Here again it is not so much a case of difference in toxicity but due to the fact that the zinc and copper salt leach out of the wood, leaving it susceptible to decay. Coal tar creosote, on the other hand, does not leach out nearly so rapidly nor has it a corrosive action on iron and hence its extensive use. Therefore, I say the forest pathologist must at all times consider the use made of his product.

Let us now briefly take up the matter of the preparation of the forest pathologist. I know of no course offered in any college in the country that prepares a man specifically along the lines that I have discussed, and yet that is no reason why we cannot work towards that goal here at Idaho. The question therefore naturally arises in the mind of those of you who have given some thought to the taking up of forest pathology, "How can I prepare myself for this line of work?" In answer to that question, I say that it is essential for the successful forest pathologist to be no less of a botanist than a forester, and not much less of a chemist than either of the two.

In forestry, besides having a good general knowledge of the subject, it is absolutely essential that he have specific knowledge of management, silviculture, dendrology, wood technology and preservation. In botany, a general knowledge of botany and morphology are essential and pathology, mycology and physiology are basic and must be had before one can study the relations between pathology and forestry. This relation between forestry and pathology is my idea of forest pathology and can only be profitably given to the student after he is well trained in both.

As regards chemistry, inorganic and organic, qualitative and quantitative analysis is absolutely essential. The student of forest pathology should also miss no opportunity to perfect himself in general chemical procedure, that is, the making up of standard normal and molecular solutions, since he will find that he will not get very far before he runs into a snag if he lacks this knowledge.

I have thus briefly outlined some of the essential requirements for a well prepared fore pathologist. I will not deny that it will take a little effort on the part of you who wish to take up this line of work, but I will deny that it can't be done. It is entirely up to you. The various departments most vitally concerned in your instruction in this line of work are as well prepared to take care of you here at Idaho as at any other institution in the country and in many respects better prepared.

A brief word in conclusion as to the future of those of you who decide to take up this work. In my opinion, it is only a question of time before each national forest has a forest pathologist. There are even now laboratories of forest pathology such as are located at Spokane, San Francisco, and other places. There are important places in the Forest Service and to those of you who would rather go into private work, there is the opening as a consulting timber engineer. You ask where are the consulting timber engineers—there are a few, not many—but not a few because of the lack of opportunity, but rather because of the dearth of men that can handle it. The opportunity is there for those of you who wish to take advantage of it.

VOCATIONAL TRAINING IN THE LUMBER INDUSTRY

C. Edward Behre.

The passage of the Smith-Hughes Act by congress in February, 1917, marks the initiation of the policy of the federal government to stimulate and expand vocational education in the different states and opens up a new educational field of interest to the lumberman and forester. This act appropriates money each year to be used in cooperation with states appropriating a sum equal each year to that received from the federal government, for the purpose of inaugurating vocational education in agriculture, home economics, trades and industries. It was designed to provide education of a secondary or elementary grade to persons 14 years of age and older, a field not covered by former federal acts appropriating money for educational purposes.

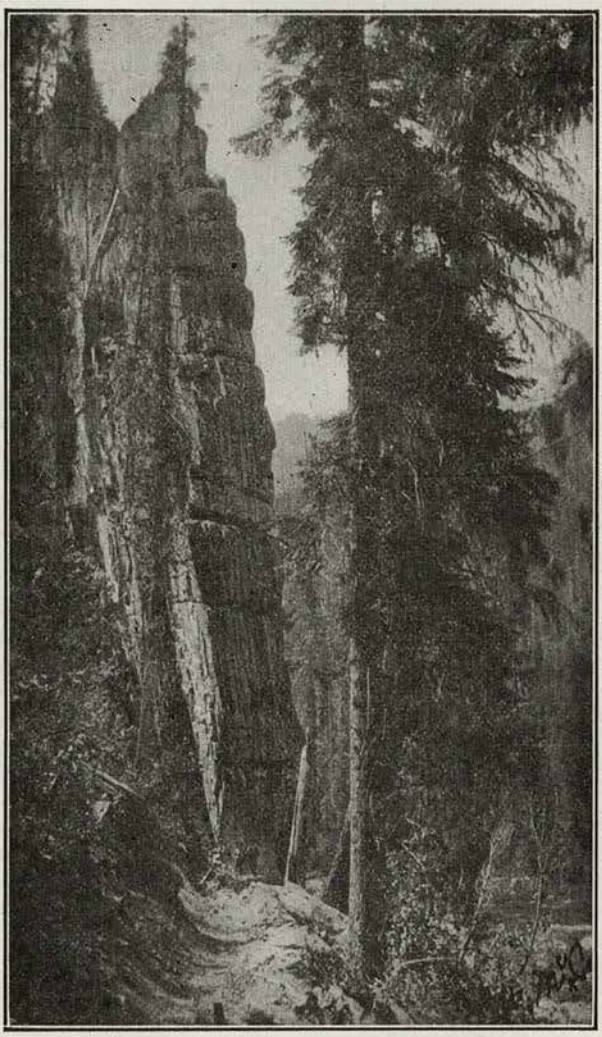
The administration of this act is accomplished by the individual states thru a State Board of Vocational Education which works in cooperation with the Federal Board for Vocational Training and in accordance with the regulations and requirements of the law as interpreted by the federal board. In Idaho the work has been gotten well under way but up to the present, more progress has been made in developing along the lines of agriculture and home economics than in industry because the instruction can be carried on in the regular high schools of the state and the teacher training and supply of teachers can be taken care of by the departments of agriculture and home economics already instituted at the state university.

In opening up the field of vocational training in industries, however, new ground must be broken, new conditions met and new problems solved. The first industry in which it was atempted to inaugurate vocational training for the benefit of the men employed in the industry was mining. At first the State Board met with very little encouragement from mine operators and others interested in the industry outside of the University of Idaho. The State Board wanted cooperation and exchange of ideas for the starting of this new line of work in the most efficient way possible but the support of the mine owners and operators who had not yet realized the possibilities of success and the advantages to be gained from this work could not be secured. Therefore it was necessary to make the first step independently and this was accomplished by taking a contract for a particular job and having all the work done by the men under instruction. The result of the experiment was very successful for the work was completed at a much lower cost than had ever been possible for similar work under the usual conditions of the industry and so the firm support and cooperation of the mine owners and operators was secured and further extension of vocational education in this industry is in progress. Next fall Mullan will have an all day trade school in assaying and milling.

In the sugar industry of southern Idaho a very promising start has been made this year by arrangement with two of the leading sugar manufacturers for evening instruction in sugar technology and other subjects. Classes of from 25 to 35 have been organized at the factories at Blackfoot, Idaho Falls, Sugar City, Twin Falls, Burley and Paul with teachers for the technical subjects taken from chemists and experts in the industry. Besides this many all day trade schools and short courses in auto mechanics and carpentry are in progress in various parts of the state.

Since Smith-Hughes vocational training has met with success in agriculture, mining and sugar manufacture, should it not be extended to lmbering, probably the second of Idaho's great indstries? When the writer was first interested in this proposition it seemed to him, just as to the mine operators, that the problem had little chance of successful solution and that the whole question seemed too new and hazy to be practicable. Having given considerable thought to the subject, however, and having had the opportunity of getting the ideas of others who have thought over and discussed the possibilities more widely, the writer now feels that not only may the problem be worked out successfully and that the start may be made at once but that also there is a distinct need for this kind of work in the state of Idaho and that its benefits will accrue not only to those receiving the instruction but also to timber owners and operators and indirectly to the country as a whole.

When the figures of the census of 1920 are published it will probably be shown that the lumber industry is second only to agriculture in importance in the state of Idaho. In past years mining has been considered as ranking



CASTLE BLUFFS—CLEARWATER RIVER
(Photo by J. H. McCrea.)

second but the lumber industry has been growing at a rapid rate with the further development of the country and the steady movement of the center of production of the country's lumber to the northwest and so may now be considered as about equal, if not already past mining as a producer of wealth in the state of Idaho. Add to this the importance of the proper handling of the lumber industry in its relations to agriculture and other industries thru the influence of the forests in reglating the flow and protecting the headwaters of irrigation projects and navigable streams and in preventing silting over or washing out of agricultural land by erosive action and there can be no doubt that it deserves whatever effort may be expended in bettering the conditions of the industry and of the men employed in it.

Unfortunately conditions in the lumber industry are anything but satisfactory and there is real need for educational work as one means of stabilizing the labor situation. Under the present system of operation the men employed in the lumber industry have less of educational facilities, either general or vocational, than in any other line of work. The industry is noted for its migratory character and the migratory character of the men employed. Many of the saw mill towns are merely an agglomeration of shacks of temporary character and are to be abandoned with the moving of the mill to another locality. The logging camps are even worse as the usual type is mounted on railroad cars providing accomodations only for the quartering and feeding of the men employed in the camps. Under these conditions the men get no chance to participate in community life and they come in touch with none of the broadening or bettering influences upon which we usually pride ourselves as Americans. It is almost impossible for them to raise a family and the result is that the lumberjack is a roving character, in the country but not of it, and being neglected by society he develops hostility toward existing conditions.
A large percentage of the laborers are uneducated foreigners and under the conditions described above, with no facilities for general or vocational education, they are easily influenced by radical agitators and become a detriment rather than a help to our society. Another class of workers found in the lumber camps are young men and boys, natives of the country and familiar to greater or less extent with the methods of the industry. Most of these have not been able to complete their schooling and their ideals and ambitions are still in the formative stage so that under the adverse conditions they are liable to become malcontents and worthless citizens whereas with better influences and opportunities they will develop into the strongest and best we can produce.

To both of these classes of workers vocational training means the opportunity to learn more of their work and to get deeper than is often possible with contact each day with only one job. It gives them the chance to do their own work more intelligently and to fit themselves for better positions by learning more of the technical, scientific and practical phases of the industry. The successful institution of vocational training should increase the interest of the men in their work. It will give them a broader conception of the importance of the industry and of the great possibilities for development which it presents which will tend to stimulate their interest in the part they are playing in this great industry and also their ambition to make good and advance with the advance of the industry. With an increase in interest of the men in their work and an increase in their knowledge of their jobs and of the industry of which they form a part will come a big improvement in the labor conditions of the industry. In the first place the holding of continuous courses of instruction of interest to the men will tend to check the roving character of the typical lumberjack. He will be less ready to throw up his job and move to another camp but will have the desire to complete the courses of study which he has begun. This, added to the increased interest in the work itself should overcome much of the strain in the relations between employer and employee and lead to a closer spirit of cooperation on all sides. The direct gain to the industry from this step in adjusting the intangible mental or psychological attitudes of employer and employee is hard to gague but anything tending to change the attitude of employee from the disinterestedness, passive resistance or even active resistance to the welfare of the industry into cooperation and in return to change the attitude of the employer from disinterestedness in the welfare of his men into one of willing help and interest will certainly mean a much smaller turnover of labor, a large increase in efficiency and therefore a lowering of the costs of production. If the instruction is

broad enough and thoro enough it should yield results in closer and better utilization of the timber and easier application of the principles of forest reproduction and protection not only on operations within the national forests but on private lands as well. Such regulations as the U. S. Forest Service requires will be easy of administration if the men doing the work fully understand the principles of forestry, utilization and the elimination of waste.

Another point which is very liable to be overlooked in a discussion of the results which are to be gained thru the inauguration of vocational training is the indirect influence which the vocational instructors may have over the uneducated foreigners for bettering their citizenship and morals. By personal example, by personal contact and conversation with the men not only during, but more forcibly outside of class hours the instructors may instill the ideals of democracy, of decent living, thrift, public interest and cooperation into the minds of a class of men largely apart from the influences usually developing these things and constantly under the influence of the activities of such radical organizations as the I. W. W. In other words thru the instructors is presented a very potent means of combatting without arousing hostility the unstabilizing influences in the lumbering communities and working for the Americanization and making of good citizens of the large foreign population found there.

From the above discussion it may be seen that altho all plans for introducing vocational training into the lumber industry are designed for the benefit of the workers, much gain will also accrue to the operators and owners and indirectly to the country as a whole. Having funds available for this training and realizing that there is a great need for it and that the results will be of inestimable value, the question arises as to what will be the best way in which to start the instruction, and what are the subjects which are to be taught. It is necessary to proceed with caution at the start and not plunge headlong into a poorly conceived plan of operation, for should the first attempt to inaugurate this class of education in the industry meet with failure it will be extremely difficult to again enlist enough support to make a new start.

There are three things to be considered, not including the subject matter of the courses to be offered. First of all the question arises as to who should be chosen as instructors for this work. It is obvious that, in order to command the attention of men already engaged in the work and more or less experienced in its different phases, men of considerable maturity and practical experience themselves must be found. Educational qualifications and training as a teacher will have to take second place to experience and recognized leadership in the subject to be taught, although the Smith-Hughes Act requires that the instructors have or take some training in teaching before being fully qualified. As it will be impossible to find men with the proper experience who have also had any teacher training it will be necessary for them to start work now and get whatever teacher training is required by the law while on the job.

The next question is in regard to when and where the classes should be held. The Smith-Hughes Act provides for the establishment of all day and part time schools, each with a required minimum number of hours work per year, and of evening schools or classes without any requirements to to length of session. Here in Idaho the extension of Smith-Hughes education to the lumber industry is being planned in cooperation with the state university but the difficulty of persuading or arranging for men employed in the industry in widely scattered parts of the state to leave their jobs in order to come to Moscow to get the benefit of the instruction to be offered presents itself at once as an objection to holding the instruction at the University.

Again, the impossibility of giving the instruction desired away from actual operations makes it apparent that much, if not all, of theinstruction must be given at the saw mills or logging camps themselves. This conclusion is also reached if the possibility of establishing a school at some central point in connection with some single operation is discussed because here again the difficulty of bringing the men away from their jobs in other camps or other operations to attend the school at a central point must be met. It is extremely unlikely that many of the men would be willing or able to sacrifice their jobs and their wages for the time necessary to attend all day or part time schools held either at the university, at some central point or in the camps themselves. On the other hand it is not probable that the employers would be willing to allow many of the men leave of absence with full pay while taking this work,

altho they would be willing to help to some extent, so that the only alternative for taking care of the greatest part of the work must be to hold evening schools or classes in the different saw mill communities or logging camps in a way similar to that already tried in the sugar industry. However, there are several important lines of instruction which can be better handled at the university than anywhere else because of the equipment needed which is already installed and available at the university, because of the expense which would be involved in transporting this equipment from camp to camp and because of the presence of the best qualified instructors in these fields at the university. Examples of such courses are engineering subjects dealing with gas and steam engines, power plants, etc. It is probable that when the work has been inaugurated the advantages which accrue to the employers will make them willing to help meet this situation by extending leave of absence with full or part pay to the men for a period necessary to complete the courses offered at the university. The carrying of most of the work as evening classes in the different camps will mean that the instructors of the different courses will have to travel from place to place, carrying what equipment is used in the work with them. This should present no great difficulty for here again the work should prove of such benefit to the operators that they may be willing to help defray the transportation costs involved.

The third question which has been brought up for discussion in considering just how to get the work under way is who should constitute the first class? Should the men to attend be selected, should the first classes be designed for a special class of men as for example, the foremen, or should the various classes be open to anyone desiring to attend? There sems to be little doubt that the last mentioned alternative is the best when all things are considered. The instruction and the arrangement of the work must be handled so as to make it attractive to the men. They must not feel that the instruction is being pushed by the employers as a means of getting more work and money out of them nor must they feel that there is any obligation or compulsion connected with it. The first suggestion of selecting the men to attend the classes might foster the idea that the company was holding the work solely for their own profit if not handled carefully but if the company is cooperating to the extent of aiding in some definite way as for example granting the men leave of absence with pay while at the school, the selection of the men may make the chance to attend a sort of prize to those who really want education and so may greatly improve the spirit of competition among the men. The second suggestion of limiting instruction at first to the foremen would necessitate the establishment of a school at some central point which presents the difficulty outlined above. Altho there may be much to be said in favor of one or the other of these two plans of recruiting the first classes, the idea of voluntary enrollment open to all seems to be the most feasible and most likely to quickly acquaint the men with the aims and scope of the vocational plan and the most likely to meet with the uniform support of everyone concerned.

Having reached then a tentative plan of operation it remains only to outline what courses might be offered. Of the following eleven lines of study suggested, the first four can be handled most efficiently at the University as explained previously, while the last seven will adapt themselves most readily to instruction in the camps. It is with this latter class of studies that the work must be commenced for it will be necessary to get the men interested in the vocational training by instruction brought to them in the camps before many will be influenced to go to the University for their training.

1. Steam Engines, Turbines and Power Plants.—A study of the properties of steam and its generation and of the construction, operation and repairing of the different types of steam engines used in logging and saw-milling would be of fundamental importance because at present steam is the chief source of power for both logging and milling operations in this country.

2. Internal Combustion Engines and Motor Transportation.—The importance of gas and gasoline engines in the lumber industry is on the increase and familiarity with the construction and operation of all types of internal combustion engines is bound to be of value to the men engaged in the industry. Besides a study of gas engines used for such purposes as pumping water, driving electric generators, cross-cut saws, etc., the field of galsoline engines for motor trucks and tractors has recently become of great importance. The course of study in this case

would not only include the motors themselves but also the different types of construction and manufacture of tractors, caterpillars and trucks and so would aim to fit the men for responsible jobs on operations using any standard type of motor transportation and give them the basic understanding of the problems and principles of successful machines which will aid them in meeting new problems and conditions or correcting deficencies of existing standards.

3. **Electric Generators and Motors.**—The use of electricity in the lumber industry is also on the increase and men in the industry will be easily interested in work designed to improve their acquaintance with electric machinery. Portable electric lighting systems are now used almost universally in the logging camps of the state, electrically driven sawmills and tramways are increasing in number and electric motors suitable for use in yarding are rapidly being developed. There are very few men in the industry well qualified to handle this newly introduced machinery and in order to help its development and insure successful operation of new installations of electric machinery there is a real need for men who understand the principles of its construction and operation.

4. **Blacksmithing and Steel Technology.**—The developments of recent years in the technique of the manufacture of steels have been so great that there are really very few men, even among those who follow blacksmithing as a trade, who are really competent to handle properly in the forge the different varieties of steel. The changes which are being made in the composition of the steels used for different implements and purposes entail special methods of heating, working and cooling in order to give the results desired and the old time blacksmith, successful as he may be with the materials upon which he has learned his trade, is often found incapable of turning out satisfactory work with new materials. The blacksmith should therefore be acquainted with the composition, properties and proper method of handling all the standard makes of steel. Thus there is open a large and extremely attractive field for the blacksmiths in the industry which will greatly increase their earning power and greatly increase the satisfaction they derive from their daily work.

5. **Saw Setting and Filing.**—On most of the operations in Idaho it is customary to employ saw filers who keep all the saws used on the operation in condition. Outside of the saw filers themselves there are only a few of the men who understand the fine points in the technique of saw filing and the saw filers are apt to guard jealously their knowledge in order to keep up a demand for their services. The condition of the saws turned out by saw filers is a common source of discontent among the sawyers and of trouble to the foremen and even an excellent saw filer may have to be discharged in order to quiet the men whose antipathy is often aroused and stimulated by agitators working only for the disruption of the smooth operation of the camp. A course in saw setting and filing followed by all the sawyers would enable each one to care for his own saw and should therefore obviate the necessity of keeping saw filers on the payrolls. Furthermore the depreciation and breakage of the saws and equipment would be reduced because each man would be depending upon his own work for the condition of his tools and would therefore do his best to keep them in good shape. On one large operation in norther Idaho all the saw filers were recently discharged and the care of the saws entrusted to the men using them. The result was an increased amount of breakage and loss of tools, because the men did not understand the technique of saw filing, but this loss was considered well compensated by a reduction of the discontent among the men and increased efficiency on the job. In a case like this a course in saw filing open to the men would have been of great value to them in enabling them to accomplish their tasks with less effort and to the operators in reducing the amount of depreciation and loss. The instructors for this work might be secured from among the expert filers employed by some of the leading saw manufacturers of the country.

6. **Scaling.**—Scaling is an art supposedly well understood only by those who have spent years in daily contact with the species being handled. Skill in scaling does not consist in merely laying the scale stick across the end of the log, reading off a figure and recording it in a notebook but it comes thru the ability to give proper scale to defective logs, to properly judge of the extent and character of visible defects and make suitable deductions from the scale read from the stick. A course in scaling would be designed to give the men a knowledge of the nature of the different kinds of defects and of the

methods of making proper allowance for them based on actual mill scale studies of the amount of material lost thru defects of different sizes. In other words it aims to give the young man in a short time much of what the old scaler took years to acquire and to base this not upon personal judgment so much as upon actual measurements. To do this the course had best be handled at the mill, scaling the logs on the deck, watching them being sawed, tallying the lumber produced and finally checking the results against the original scale allowed. This is the best method of studying scaling and incidentally gives the men a better understanding of the factors which cause overrun and of the relations between mill tally and log scale.

7. Grading.—The grading of lumber is another subject which might be taken to good advantage not only by those who intend to become graders or who are already employed as such with the intention of getting a better understanding of the grading rules used by their own company and of operators in other sections but also by others employed in the woods and mill. From the bucker who cuts the tree into logs to the grader himself nearly every man who handles the material, except those engaged only in transportation, may in some way affect its grade and hence its value. To cut the trees into logs which will yield the highest percentage of upper grades the bucekr should be familiar with grades, grading rules and relative value of the different classes of material. In the mill the eawyer, the edgerman, and the trimmerman all have their influence upon the quality of the lumber produced and to be able to make the best cuts quickly and well, as they must, an increased knowledge of grades and grading should prove of great value.

8. Cooking and Kitchen Administration for Logging Camps.—One of the greatest needs felt by many operators in the lumber industry is for good cooks. Unsatisfactory service in the kitchen is one of the most serious sources of discontent and trouble to be met by the foremen, and apparently there are very few well qualified cooks to be found. A good cook should not only be able to turn out meals satisfactory to the men but must be able to do this cheaply and with as little waste as practicable. The ability to make tasty dishes for supper from the odds and ends left from other meals is as much of an asset as the ability to make good bread. Furthermore the cook should understand sanitation and be cleanly in all habits around the kitchen for any carelessness which might lead to sickness of a few of the men may result in a general exodus of the rest. A course in cooking would therefore fill a decided need for the welfare of the industry.

9. Care of Animals.—Even on operations on which most of the transportation is taken care of by power in one form or another the use of animals under some conditions and for some seasons continues to be the cheapest method of getting out logs. A course in the care of animals should include some veterinary science and training in judging of good stock besides the study of feeds and the best methods of feeding and tending stock under different conditions.

10. Utilization.—The subject of utilization is one of much interest to the logger because of its influence upon returns from the operation and to the public in general because of its influence upon the yield secured from a waning resorce. Whatever standards of utilization may be required will be much easier of application and administration if the men doing the work understand in what ways a little more care or slight changes in ordinary practices may increase the amount of material secured, reduce the amount of breakage or increase the percentage of upper grades yielded.

11. Forestry.—An elementary study of forestry should be included in any plan for vocational training in the lumber industry because it is important for the perpetuation of the forests of the country that the principles of forestry be understood by the men working in the woods. They should be given instruction first in the fundamental principles of tree growth and reproduction, matters on which the average woodsman often shows unbelievable ignorance. For example, it is commonly supposed by many in the southwest that the Yellow Pine or mature tree is an entirely different species than the Black Jack or immature specimen of the ordinary Western Yellow Pine. Naturally enough this belief makes it difficult to convince such people that the leaving of Black Jack seed trees will some day lead to another crop of Yellow Pine timber. Another subject in which the woodsmen should have some knowledge is the silvics of the diferent species of the region in which he is working in order that he may understand their relative value and ease of reproduction. Detailed studies of the regulations imposed by the United States Forest

Service on timber sales in the national forests would be of great value in illustrating the silvicultural or other reasons for their existence and the possession of this knowledge by the men will make much simpler the proposition of enforcing such regulations not only on the national forests at present but also upon private lands in the near future when private operators also will be following the practice of forestry. A fourth branch of forestry which is probably the first in immediate importance and practical application shold be fire protection. Different methods of brush disposal and the theory and practice of fire fighting as well as preventative methods would form the subect matter of this course. Instruction along these lines should also prove a very powerful means of spreading the propaganda of safety first and fire prevention in the woods.

The subjects thus outlined as material with which to get a plan of vocational training underway will doubtless be modified and expanded as the work progresses but we cannot learn the true size or value of the field ahead until we have taken down the bars and actually entered and explored it. What we need now to make the start is the active support of all those interested in the industry which means cooperation with operators and owners, both large and small, and with the U. S. Forest Service and its officials. Several prominent owners and operators have already been acquainted with the plans of the State director and in general they realize the need of some action tending to improve labor conditions and they feel that plans for education as outlined above will help meet the situation and will be of great value in other ways also. The proposition has also been discussed with officials of the Forest Service and the merits and desirability of the plan have brought this department of the government service into firm support of the movement. It is hoped that the State Director will be able to crystallize ideas and plans into action next fall so that Idaho may get the benefits of the Smith-Hughes act for the lumber industry without delay.

XI SIGMA PI

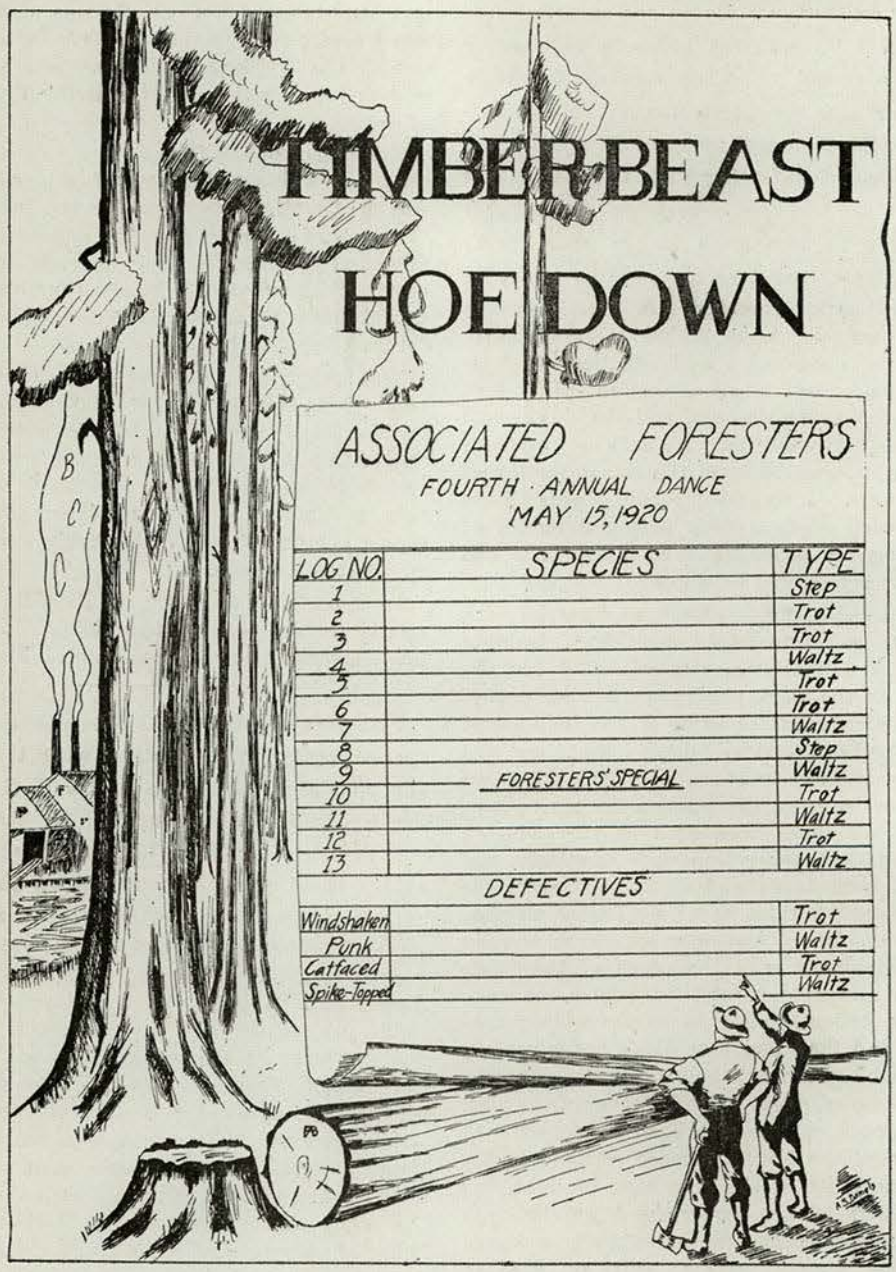
National Forestry Honor Fraternity, Alpha Chapter. Xi Sigma Pi fraternity was founded at the University of Washington in 1908. In 1916, Beta chapter was installed at Michigan Agricultural College, Gamma Chapter at the University of Maine in 1917, Delta Chapter at the University of Minnesota in 1920, and in 1920 Epsilon chapter at the University of Idaho.

The object of the fraternity is 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 members engaged in forest activities. The results obtained have been most encouraging and the future of the fraternity is assured.

The society as organized is peculiar among honor fraternities in that it requires for membership not ouly a higher standard of scholarship but an ability and a personality suited to auctual forest practice. Membership is limited to upperclassmen who have shown a high grade of scholarship and marked practical ability.

It is hoped that Xi Sigma Pi will be no small factor toward upbuilding forestry at the University and in the state of Idaho.

Professor Behre will be occupied with a special study in connection with the problem of land classification for the U. S. Forest Service during the summer. In the white pine region of northern Idaho there are many areas classified as agricultural on the basis of soil quality which officials of the forest service believe will yield larger returns if producing a second crop of white pine timber. Agriculture on these lands is proving a difficult proposition and it is doubtful if adequate returns on the money expended are being made. Therefore should investigation confirm the opinion of the forest service officials that the highest use of these lands is found in forest growth it will mean a change in the policy of cutting upon them. At present the policy of the forest service is to clear-cut lands of agricultural value and throw them open for settlement but should it be shown that these lands had best be held to produce another crop of white pine the cutting will have to be modified to provide for the reproduction of the species desired. Being distinctly an Idaho problem, the District Forester called first upon the University of Idaho for help in getting definite information on the subject and Professor Behre has been given leave of absence from the University to undertake the work this summer.



"The Timberbeast Hoedown," the Fourth Annual Dance of the Associated Foresters, held on May 15 was one of the best all-college dances of the year, despite the fact that the custom of making it a "rough neck" affair could not be adhered to. Unavoidable conflicts in the schedule of all-college activities was the cause of the dance being, as one person was heard to say, "the only civilized dance the Foresters ever gave." However, plans for next year's dance are to make is a rip-roarin', wild western affair with all the consideration for life and property the 'beasts can be held to.

The above cut represents the exact size of the program, which was printed on thin pieces of white pine. They were very much in favor, probably due to the high prices of lumber.

Everyone having come prepared for a good

time (as they always do for the "Hoedowns") and with lots of "pep" and "jazz" to the music, a good "kick" to the punch and a good floor, the dance was a success from the start. Dean and Mrs. Miller, Dr. and Mrs. Schmitz and Prof. Behre were patrons and patronesses.

THE ANNUAL BANQUET

The Associated Foresters held their Fourth Annual Banquet on Wednesday evening, March 10, 1920, at Moscow, Idaho. The banquet was attended by over forty members of the club and their guests and was a success from start to finish. The guests of the evening were Prseident E. H. Lindley of the University of Idaho, A. D. Decker and Donald Yates of the Potlatch Lumber Co., of Potlatch, Idaho, and Major F. A. Fenn, chief of the office of lands in District 1 of the U. S. Forest Service at Missoula, Montana. The Forest Club had also hoped to have the company of T. P. Jones of the Potlatch Lumber Co., I. W. Cook of the Winton Lumber Co., and Ben Bush of the state land department, but impassable roads prevented Mr. Jones and Mr. Cook from getting to Moscow and Mr. Bush was unavoidably detained by business in Spokane.

The program which consisted of talks by the guests and members of the club was intensely interesting and enjoyed by all. Prof. C. Edw. Behre, acting as toastmaster, introduced first Mr. Decker, who spoke on "The Practice of Forestry by Private Owners" and expressed the opinion that progress along this line could not be successfully secured by mandatory legislation, but that the solution of the national forestry problem lay along cooperative lines. President Lindley of the University of Idaho, who could only remain at the dinner for a short while because of other pressing engagements for the evening, talked for a few minutes upon "The Spirit of the Forester." Mr. A. S. Dainels, president of the Associated Foresetrs of the University of Idaho, then gave a short talk outlining the history, activities and aims of the Forest club.

The speech-making was discontinued at this point to listen to a violin solo by E. H. Vick, a student in the Ranger Course at the Forest School. Mr. Yates, in discussing the logged-off land problem outlined an idea for removing and utilizing the waste material on logged off land for agricultural development by a stock company undertaking the production of fuel wood, resinous by-products and pulp for the utilization of the material from cut-over land at present that an enterprise which undertook all at the same time would be able to succeed. Mr. H. W. Staples of the senior class of the Idaho School of Forestry then gave a short but interesting talk on aeroplane fire patrol, basing his remarks on experience gained as a lieutenant in the U. S. Air service during the war. Mr. H. W. May, a U. S. forest ranger, speaking as a representative of the Ranger Course, pointed out the advantages to the field man in coming to the University of Idaho for the short course.

The last speaker of the evening was Major F. A. Fenn of the U. S. Forest Service, who addressed the gathering upon his work with the Forest Service in developing the recreational uses of the national forests for the public. Major Fenn has the distinction of being one of the first six pupils to attend public school in Idaho Territory and has been in the U. S. Forest Service for over 20 yaers. Some of the interesting incidents of the early days of the Forest Service related by Major Fenn were a revelation to those who knew the Forest Service only from its present stage of development and prestige.

THE SCHOOL IN 1919-20.

By F. G. Miller..

The School of Forestry has made substantial progress the past year. The registration has been the largest in the history of the School. The teaching staff has been increased to pre-war strength, the laboratory facilities have been enlarged and important new projects have been launched, notably a reconnaissance of the university and other state timber lands, by which the activities of the School have taken on a more state wide character than hitherto.

The Enrollment.

Just 96 students have been under instruction in forestry this year. Of these, 37 were registered in the long courses, 6 in the short course, 19 in the correspondence course in Lumber and Its Uses, and 34 from other departments. While the registration in the short course was not large, the quality was unusually high. Originally, 9 men applied for this course, but 3 of them later transferred to the long course, and others expect to return to enter the long course next year. The number of inquiries from prospective students regarding both the long and short course has

been much larger this year than usual, and a substantial increase in both courses the coming year is assured. Students from other departments are electing forestry courses in increasing numbers.

The correspondence course in Lumber and Its Uses announced for the first time in January, 1918, has met with a hearty reception from the start, nearly 100 students from 30 different states having registered for the course to date.

Faculty Changes.

The vacancies caused by the resignation of Prof. H. E. Schmelter in July, 1918, to enter the war service, and by Prof. I. W. Cook in August, 1919, to accept an important appointment from the Winton Lumber Co., were filled by the appointment of Dr. Henry Schmitz and Prof. C. Edward Behre. The School was also fortunate in securing Messrs. C. E. Favre, S. V. Fullaway, and M. H. Wolff, all of the U. S. Forest Service, each to give a series of lectures before the School in the winter. The plan of cooperating with the Forest Service in this way proved so satisfactory that it will probably be made permanent.

Changes in Ranger Course.

Beginning next year, the Ranger Course will be reduced from a three year to a two year course of five months each. While it is urged that students take the entire course if at all possible, the work has been so blocked out that those students who cannot be in for a longer period, may enter at the beginning of the second term in January and get a twelve weeks' unit course as an entire schedule of new subjects begins at that time. The Ranger Course is proving especially attractive to ex-service men.

New Curriculum.

In response to a growing demand for a curriculum designed for men wishing to enter the lumber business, such a course will be offered the coming year. The freshman year will be the same as for the other curricula. But beginning with the sophomore year, students will be permitted to elect such courses in political science and other departments as will meet their needs. With the rapid concentration of the lumber industry in the west and northwest, the lumber business offers a most inviting field for young men planning for a commercial career.

Reconnaissance Studies.

Reconnaissance studies on the University lands were begun last summer, and will be continued each summer till they are all covered. This will require several seasons. In cooperation with the state board of land commissioners, the work the past season was done on the state lands about Big Payette Lake, which lies about 90 miles north of Boise. Some 15,000 acres were cruised and mapped, and several hundred acres were marked for cutting. The School was given charge, during the summer, of the timber sale then underway. The terms of this sale, covering about 2500 acres, mark an innovation in the handling of state timber lands in that they provide for such cutting regulations as well safeguard forest renewal as well as the scenic features of the lake front .

Demand for Men.

Calls for men in forestry, both for permanent positions and summer employment have been far in excess of the ability of the School to fill. A large lumber concern in Virginia put in a request for several men for the summer vacation. Another came from Wyoming, and several calls were received from the Forest Service in other forest districts. Practically all of the students, however, have taken employment in our home state. Wages for the summer employment this season range from $80 to $125 per month and field expenses.

WHY IS A RANGER?

Oh, a Ranger is in danger of congestion of the brain, if he tries to keep all posted up on every latest plan. He is but one lone mortal, at the crossing of the ways of a thousand different theories, of a thousand different days. He must be an expert woodsman and a guide and trapper, too; and must know in all emergencies the proper thing to do; how to fix a motor, mend a leg or rope a steer, play a tune on the typewriter to please the diplomatic ear; also how to run a survey, find a corner where it ain't, and, in extra stressful moments exercise restraint. He must be a sawmill expert, cowboy and lumberjack, and an information bureau, plumb full of statistic fact. And he must be trained in botany, know every growing plant—so's to educate the cattle what they can eat and what they can't. He must know the birds and animals, the insects and the fish, their every need and comfort, their every wile and wish, including why a wood chuck would and why a dodo don't, as well as why a whippporwill and a coyote won't. All professions and sci-

ences and every common trade is the fund of useful knowledge for which he is so princely paid. And still there is something to it that holds the Ranger on, when he tells himself and all his friends that he would fain be gone.

THE APPLICATION OF A TRAINING IN FORESTRY TO THE LUMBER BUSINESS

By Donald Yates, '17.

The training of a Forester has several aspects differing from that of an engineer or most other types of technical men, due to the comparative infancy of the science or at least its development and application in this country. The importance of engineering as a profession is well acknowledged popularly and even quite generally understood to the extent of a conversational knowledge. Consequently it meets with sympathy everywhere and its application is rather stabilized, though of course always progressing. But to the general public, Forestry means very little. You have undoubtedly had ridiculous questions put to you concerning what it is, by people otherwise well informed who should be ashamed of ignorance of a subject so seriously important to the American people today. Furthermore, its application is so limited as yet that even your course of training is rather unsettled as compared with other technical courses. Your curriculum undergoes frequent changes, you are often hard pressed to decide which of the many needed subjects are most needed, and your faculty are forever looking for new, up-to-date information and methods tried in the field and found practicable. While this is true in all professions, it is much more in evidence in the one you are pursuing, I believe.

Quite frequently all of this leads to dissatisfaction in a Forestry student or lack of faith in his work. A germ starts somewhere in his system which causes him to question his own judgment as to the way he is spending his time. It is the same germ that attacks all pioneers. If I could give you a little encouragement on that score, I should consider my time and yours well spent.

A thought which persistently harassed me in college was, "Exactly what of that which I am absorbing will be of practical use to me later when I go to work, and how valuable will the balance be, if at all?" Such a thought is immature, boyish, of course, but I think we all get it who are preparing in a practical course of training.

Of course it is well understood that we must supplement our training with a practical apprenticeship in the business for which we are preparing. Without the latter, the former is nothing. Several able papers in the Timberman for October emphasize this fact and we all acknowledge it anyway. You don't see many graduates blundering into the practical world nowadays with a diploma sticking out of their suitcase, looking for something on a silver platter. They have that all taken out of them long before graduation and probably a greater fault lies in lack of confidence. The point I intend to discuss is how much do we learn in school of what we might learn and what we do with it.

Let me say right here, that I believe that while there is a great deal learned in school, that is not used practically later and still more not learned that might have been in school, and would be very valuable to you, there is a large proportion of what you absorb in your Forestry course that you will use with direct realization as well as unconsciously.

Usually one cannot prepare in all of the subjects he will need, even of those that are offered, but will be compelled to get it "outside," because he doesn't know exactly what he will do except that it will be Forestry work of some kind. However, he should strive to decide as nearly as possible what it will be and prepare accordingly. The more nearly right his decision, the more valuable his training will be to him.

The lumber industry offers a world of opportunities to men interested in the study of forests and forest products. Your course of study deals directly with some of them. Logging engineering is a profession which is more and more calling for men skilled in its practice, who are at the same time educated, progressive, technical as well as practical, and above all loyal and dependable.

Fire protection has grown to be a paramount problem of lumbermen with large holdings, especially of white pine and other species so susceptible to fire hazard. Yet they are quite dependent on men trained in Forestry for the development of modern timber protective plans.

Probably the greatest opportunity of all is the study of taxation. It is the lumberman's Jonah. He always has his troubles, the car situation, labor troubles, the fire season or

something else, but taxation is perhaps one of his chief concerns. I shall not go into the details of it for you have doubtless been informed of the erroneous principle upon which timber taxation is based. More than one man has made himself valuable to the lumber industry because of a study of timber taxation laws and principles and the field is still unlimited.

The October number of the Journal of Forestry contains an excellent editorial lamenting the private forestry situation. It is a proper complaint and lumbermen are by no means ignorant of the seriousness and eminence of the problem of perpetuating our timber supply, but how is it possible to practice private forestry in the face of a tax on timber which is based on the actual stand each year and not on the harvested crop, thus forcing as rapid cutting as possible, even of immature trees?

There are many other unmentioned fields in the lumber business open to you in all of which you would find your training directly applicable; the selling end, mill work, grading, by-products incidental to lumber manufacturing and paper pulp.

As to my own department, one might say that we are everything from lumberjacks to lawyers. A brief enumeration of the scope of our work will give you an idea of to what extent a schooling such as you are getting might be applicable.

1. Keeping of all records of land and timber titles.
2. Land sales, mapping, appraising, showing, etc.
3. Land and timber purchases—office details.
4. Compilation of estimates and computation of timber values.
5. Special uses of lands; meadow rentals, cordwood, etc.
6. Small or local logging contracts.
   (a) Leasing, appraising, scaling, etc.
7. Grazing 10,000 sheep, several hundred cattle.
8. Farming several hundred acres.
9. All taxation matters.
10. Surveying, drafting, mapping, occasional estimating.
11. Keeping up with State and Federal laws of all kinds, realative to lumbering.
12. Highway work.
13. Correspondence.
14. General touch with woods and plant operations.
15. Special work in Fire Protection as the emergency arises.
16. Everything that has no particular department falls to the land department.

We have probably as much business as is in a busy supervisor's office, if not more.

A question which many of you are doubtless trying to figure out is the one of relative opportunities with the Forest Service or with a lumber company. It seems to me that the answer depends entirely upon the individual. If your temperament is one that fits in well with public service work, if you love outdoor, healthful work and love work for the joy of doing it and not alone for your pay check, I know of nothing that should be more self-gratifying than to be one of that splendid corps of men who are doing so much for the nation by endeavoring to manage properly and save for a careless American public their supply of timber.

The lumber business is more attractive from the standpoint of salaries and the work is just as inviting and healthful. It is too bad that such important government work is under paid but it is to be hoped that people will wake up to the importance of this and a few other professions such as teaching, and put them on a proper financial basis. Your choice between the government and a lumber company depends on you, your temperament, and your enthusiasm for the work itself. One thing to bear in mind in that regard, however, is the proportion of privately owned timber to Federal and State. At the present time about 78% of the nation's timber is privately owned, and about 97% of the timber and wood products is obtained from private forests.

I have said that the more nearly correct a student's decision as to what his work will be, the more valuable his training will be to him.

Also I might better say, the value of your course will be just exactly proportionate to the amount of effort, energy and enthusiasm which you put into it. If you are taking courses in which you have little faith or enthusiasm, and cannot develop any, you are indeed wasting your time. By all means develop enthusiasm and faith and don't let the pessimistic attitude of a fellow student keep you from it.

You have considerable choice of subjects in spite of your heavy curriculum. I believe in specialization as soon as possible, but not to the extent of a one-sided development. A little sociology, or business administration if possible, may prove very valuable later. My

experience so far has been that the hardest courses are always the best. College training of any sort, if thorough, is always an asset and a good investment. It is not so much what facts you have stored away, but the ability to pick up and develop plans and schemes otherwise foreign, the mind sympathetic with scientific methods and progressive ideas, the knowledge of where to find and how to organize desired information, that counts, all of which comes to the university trained man.

ROSTER OF STUDENTS

CLASS OF 1920

Bedwell, Jesse Leonard, Council, Idaho.

Staples, Howard W., Xi Sigma Pi, Alpha Zeta, Alpha Kappa Epsilon; Vice-president A. S. U. I.; President Associated Foresters, 1918-'19; Business Mgr. "Idaho Forester," 1920; Moscow, Idaho.

CLASS OF 1921

Cossitt, Floyd Morgan; Xi Sigma Pi; 308E 10th St., Weiser, Idaho.

Drissen, John Philip; Xi Sigma Pi; Pres. Associated Foresters, 1920-'21; Associate editor "Idaho Forester;" entered from W. S. C., 1919; Harrison, Idaho.

Gerrard, Paul Henry; Xi Sigma Pi; Beta Theta Pi; entered from W. S. C., 1918; Vancouver, Wash.

Patrie, Carthon R.; Xi Sigma Pi; 7 Plymouth St., Plymouth, Wis.

Redinger, Clyde Edison, Adams Basin, N. Y.

CLASS OF 1922

Brown, Frank A.; Kappa Sigma; Sec.-Treas. Associated Foresters, 1918-19; Associate Editor Foresters' Annual; "I" Football, 1919; 308 State St., Boise, Idaho.

Buckingham, Wm. E.; Sigma Alpha Epsilon; Gifford, Idaho.

Chamberlain, Gail B.; Sigma Nu; Coeur d'Alene, Idaho.

Daniels, Albert Stanley; Alpha Kappa Epsilon; Pres. Associated Foresters; 1919-20; 601 S. Henry St., Bay City, Mich.

Edwards, Kenneth Duncan, Nampa, Idaho.

Farrell, James W.; Alpha Kappa Epsilon; Secy.-Treas Associated Foresters, 1919-20; Vice-pres. Associated Foresters, 1920-21; Editor "Idaho Forester," 1920; New Meadows, Idaho.

Melick, Harvey Ivan, Nampa, Idaho.

Miller, William Byron; entered from W. S. C., 1919; Stevenson, Wash.

Nero, Edward T.; Vice-pres. Associated Foresters, 1919-20; Secy.-Treas., 1920-21; R. F. D. 3, Moscow, Idaho.

Ryan, Cecil; Kappa Sigma; Moscow, Idaho.

CLASS OF 1923

Barto, Harold; Kappa Sigma; Spokane, Wn.

Brockman, Cecil C.; Sigma Nu; Bickelton, Wn.

Brown, Carl H.; Alpha Kappa Epsilon, Twin Falls. Idaho.

Chamberlain, Fred; Sigma Nu; Coeur d'Alene, Idaho.

Core, Glenn R.; Burley, Idaho.

Cross, Sidney W.; Sacramento, Calif.

Leitch, Robert E.; Kappa Sigma, Lewiston, Idaho.

Massey, Ivan M.; U. S. Forest Service, McCall, Idaho.

Ramsburg, G. F.; Weston, Virginia.

Rodner, Jack W.; Sigma Alpha Epsilon; Moscow, Idaho.

Space, Ralph; Weippe, Idaho.

Stoneman, John Warren; Hillyard, Wn.

Storms, Willard Sidney; Rupert, Idaho.

Walker, Everett Foster; Moscow, Idaho.

Wolfenden, William; Sigma Alpha Epsilon; Gooding, Idaho.

Eddy, Leslie Eugene, Dietrich, Idaho.

Gavin, C. H.; Heise, Idaho.

Schenberger, F. C.; Kappa Sigma; Twin Falls, Idaho.

SPECIAL

Baumann, Herman; 1314 Louis Ave., Milwaukee, Wisc.

Mason, Alvin Marion; Spokane, Wn.

RANGER COURSE STUDENTS

Martin, Ernest M.; Second; Weiser, Idaho.

May, Henry W.; First; Warren, Idaho.

Nicol, Henry Q.; Second; Reubens, Idaho.

Peterson, Raymond; Second; Moravia, Idaho.

Vick, Ernest Raynold; First; Watford City, N. D.

White, Albert C.; First; Boise, Idaho.

CORRESPONDENCE STUDENTS

Blair, Samuel A.; Dungannon, Va.

Brown, F. M.; Philadelphia, Pa.

Evensen, Linar; Shanghai, China.

Ferris, David B.; Ridley Park, Pa.

Fontanna, Stanley G.; Coeur d'Alene, Idaho.

Gribolo, Peter; Fort Sill, Okla.

Hoidall, H. I.; Stanley, Wis.

Hussey, R. E.; St. Louis, Mo.

Ingersoll, Howard H.; Philadelphia, Pa.

Lhemkuhl, W. G.; Minneapolis, Minn.

McLellan, K.; San Francisco, Calif.

Morris, Mead M.; La Grande, Ore.

O'Shinsky, Lewis; New York, N. Y.

Pack, W. S.; Cleveland, Ohio.
Reineke, Lester H.; Ithica, N. Y.
Roch, William M.; Coeur d'Alene, Idaho.
Schwarz, H. A.; Grafton, Neb.
Sheilds, Edward; Bonair, Iowa.
Smith, R. M.; New York City, N. Y.

ALUMNI AND EX-STUDENTS

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

CLASS OF 1911

Fenn, Lloyd Alfred; B.S.(For.); Attorney at law; Manager of "The Kooskia Mountaineer," Kooskia, Idaho.
Wadsworth, Herbert A.; B.S.(For.); Major, Inf. Office of the Chief, Const. Div., Washington, D. C.
Lundstrum, F. J.; B.S.(For.); Lewiston, Ida.

EX-'12

Thornton, James A.; Coeur d'Alene, Idaho.

CLASS OF 1913

Decker, Arlie D.; B.S.(For.); Land agent, Potlatch, Lbr. Co., Potlatch, Idaho.
Herman, Chas. Henry; B.S.(For.); Manager, East Oregon Lbr. Co., Enterprise, Ore.

EX-'13

Denning, Stewart K.
Heard, Herman Claude.
Hillman, Wm. P.
Hockett, Robert V.
Teed, Ryle, Forest Service Examiner, 428 P. O. Building, Portland, Ore.

CLASS OF 1914

Favre, Clarence Eugene; B.S. (For.) '14; M. S. (For.) '15; District forest inspector and Supervisor of the Humbolt Forest, Elko, Nevada.

EX-'14

Dippel, Ralph; Dentist; Springfield Ore.
Fawcett, Vernon.
Fields, Chas. Carlos.
Gildea, Howard Cecil; lawyer; McMinnville, Ore.
Parsons, Ralph Howard; Forest Ranger; Coeur d'Alene.
Rae, Chas. Arthur.
Smith, Harley Roscoe.
Williamson, Chas. Leonard.

CLASS OF 1915

Carlson, Oscar Fred; B.S.(For.); Deceased.
Stevens, Arthur W.; B.S.(For.); Amalgamated Sugar Co., Engineering Dept., Ogden, Utah.

EX-'15

Helfrich, Will Edward.
Keefe, Frank.
Stone, Lawrence Fielding.
Anderson, Mark; Pocatello.
Burns, Robert Owen; Payette.
Jones, Renaldo Vincent; Albion.

CLASS OF 1916

Schofield, Wm. Robert; B.S.(For.); Forest Service; Logan, Utah.

EX-'16

Darnall, Glenn McClellan; Payette.
Holaday, Howard W.; Deceased.
Kambridge, Antone J.; Farmer; Genesee, Ida.
McNett, Gail; Rathdrum.
Morris, Leo Francis; Weiser.
Rutledge, Walter T.; Nyssa, Ore.
Shroeder, Bert H.; Cottonwood.

CLASS OF 1917

Cunningham, Russell H.; B.S.(For.); Forest Service; Grangeville, Idaho.
Malmsten, Henry Elof; B.S. (For.); Forest Service; Odgen, Utah.
Moody, Virgil Carlton; B.S.(For.); Hope, Idaho.
Ruckweed, Fred John; B.S.(For.); Plymouth, Wis.
Yates, Donald; B.S.(For.); Land Dep't., Potlatch Lbr. Co., Potlatch, Idaho.
Youngs, Homer Smith; B.S.(For.); Deceased.

EX-'17

Johnson, Herbert Wm., Boise.
Lommason, Thomas; Colfax, Wn.
Munson, Oscar Charles; Moscow, Idaho.
Swan, Hugh Harris; Sherbourne, N. Y.
Barger, Harold B.; Browning, Mont.
Humphrey, Clyde Pearson; Coeur d'Alene.

EX-'18

Eldridge, Ferris Edwin; Entered U. of W. 1915; Almogorodo, N. M.
McMullin, George Leiby; San Francisco, Cal.

CLASS OF 1919

Jackson, Tom; B.S.(For.) With the Edward Rutledge Timber Co.; Coeur d'Alene, Idaho.
Rettig, Edwin Claire; B.S.(For.) With Clearwater Timber Protective Ass'n, Orofino, Idaho.

EX-'19

Gilman, John Elmo; Hailey.
Hyde, Clarence Otis; Oreana.

Martin, Paul John; Middletown, O.
Salvin, Otis William; Carmen.
Hamilton, Rrichard Alvord; Orofino.
Stillinger, Chas. Roy; Forest Pathology work, Room 3, Hilgard Hall, Berkeley, Cal.

EX-'20

Campbell, Howard; Commerce Student, U. of I.
Cook, Jacob Miller; Oberlin, Kan.
Cooper, Alfred; Los Angeles, Cal.
Dart, Wm. Ellisworth; Moscow.
Evans, Philip Smith; Preston.
Hammond, George M.; Retail Lbr. Business; Pocatello, Idaho.
Hanzen, Maurice Henry; Moscow.
Slavens, Ervin Howard; Spokane.
Telford, Milton McKinley, Coeur d'Alene.

EX-'21

Davis, Roscoe Richard; Star.
Oylear, Clarence H.; Middletown.

EX-'22

Allen, Thos. Wm.; Caldwell.
Ashton, Allen White; Boise.
Cable, Guy Burr; Roberts.
Daugherty, Chas. Ira; Challis.
Edwards, Kenneth D.; Nampa.
Elhart, Carlton D.; Caldwell.
Hamilton, Wm. Howard; Santa Paula, Cal.
Hart, Irving Warren; Boise.
Jones, Wm. McKinley; Nampa.
Keyes, Geo. W.; Challis.
Kingan, Fred; Boise.
Miller, Robert Adolph; Idaho Falls.
Miller, Silas Warren; Nampa.
Morrison, Frank Bernard; Barber.
Pedersen, Arthur R.; Kootenai.
Post. Claude H.; Blackfoot.
Russell, Raymond E.; Boise.
Shanner, William W.; Sandpoint.
Wiseman, Claude C.; Middletown.

FOREST RANGERS

'15-'16

Berry, Waldo Lee; Post Falls.
Cowan, Talmage Dewitt; St. Anthony.
Dodge, Kieth Allen; Challis.
Driscoll, Stephen; Moscow.
Hoke, J. A.; Moscow.
Jensen, Irving; Post Falls.
Keyes, George West; Challis.
Webster, Roy Russell; Post Falls.

'16-'17

Duncan, Robert; Joseph, Ore.
Haynes, Ralph M.; Emmett.
Huestis, Clarence; Council.
Newkick, Edwin Ely; Easthampton, Mass.
Nonini, Amerigo Louis; Mackay.
Shipman; Orville H.; Boise.
Williams, John; Boise.
Headick, Ralph Alonzo; Moscow.

SAYINGS AROUND THE SCHOOL OF FORESTRY

"Now we'll take this here datter."

"We give a d- - m."

"Now, let me see. Uh huh, uh huh, we-e-ll, now we'll go at that in just this way."

"Eh, Eh, got a hurry-up in chem. today, Eh, heh, eh, heh."

"Har yu! Har yu!"

Dr. Schmitz:—"What are ome of the detructive agent that piling is subjected to?"

"Nellie" Ryan:—"Marine rodents!"

A TRUTH

Queer things happen in this world. One Tuesday morning (8:00 Mens hation class) Dr. Schmitz, suddenly, without warning, started "sparking" so fast and violently that the reaction from said "sparking" caused Brown's chair to collapse and left his stranded "spread eagle style" on the floor. Whereupon the whole class ceased snoring, which fact so startled our dear Doctor that the mysterious "spark" flew from him and has never been seen or heard of since!

ON A FIELD TRIP

Frank Brown:—"Hey, fellows, look at the 'Bear' tracks here in the snow."

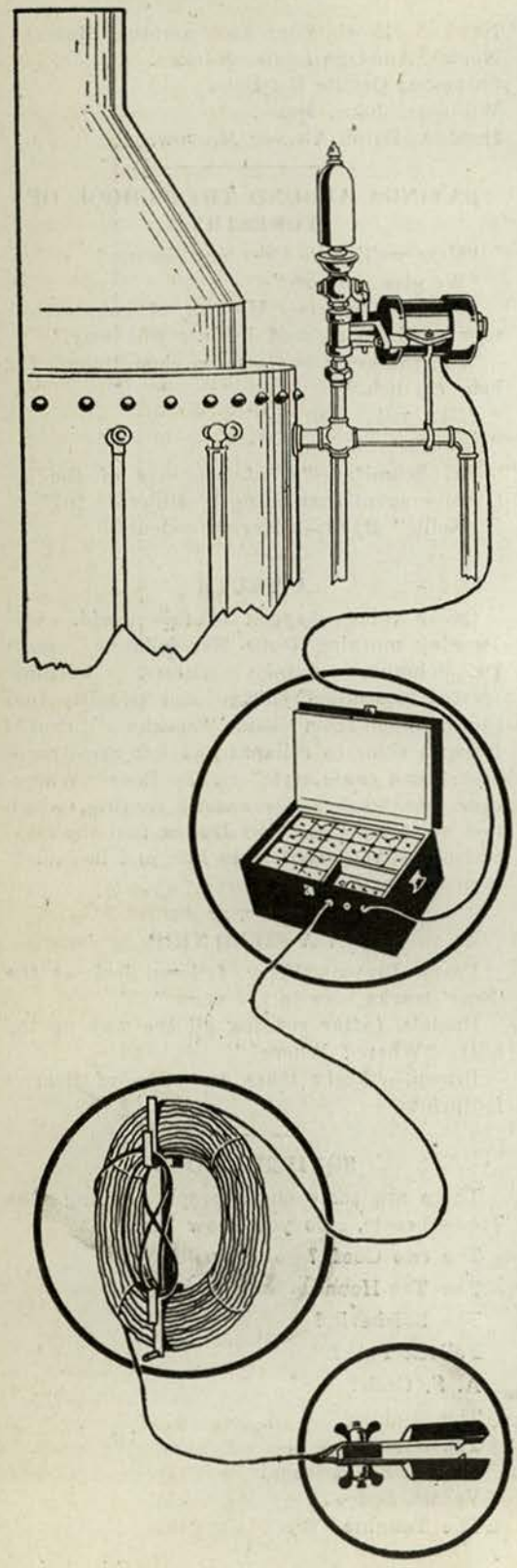
Daniels, (after running all the way up the hill)—"Where? Where?"

Brown.—"Right there are some of Behre's footprints."

SQUIRRUL FOOD

There are some queer people among the Timberbeasts. Do you know these:

The two Goofs?
The Tea-Hound,
The Bolshevik?
Pollock Pete?
A. S. Crab?
The Minister?
The Bear?
The Nickle Bruiser?
Vacant Space?
The Toughie "Bird?"



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A temper just like a Daniels', plus
A love for a timberbeasts' quarred.
A disregard of others' desires, plus
A mania for starting forest fires.
A human form plus hard-boiled clothes.
A real "hard cookie" you'll find enclosed.
A BOLSHEVIK.

"GOOF."

Jim Farrel wins the prize when it comes to getting expense money. He had the nerve to charge the state of Idaho $2.00 for "one BIRTH enroute."

CAN YOU BEAT THIS?

Extract from Farrell's cruising notes one day in July, 1919, after having gone over an area covered with huge boulders: "Entire area covered with cobblestones."—And he insisted he was right!

PERSONALS

Albert M. Mason, a Federal Vocational man, had to give up his forestry work in January on account of his poor health. He is now on a term of six months probation as a salesman of automobile accessories.

William Wolfenden, '22, (Gooding, Idaho,) was forced to drop his work at the end of the first semester because of the serious illness of his father.

Albert C. White (Ranger course) left on March 11 for a job on grazing reconnaissance on the Humbolt National Forest.

Ernest R. Vick (Short course) received a temporary appointment as Ranger of the Beartooth National Forest, Montana, and left to take up his duties, March 13. At present he is stationed on the Rock Creek District and says he likes both the country and the job.

A. S. Daniels, '22, will have charge of the commissary on the Selway National Forest during the summer.

F. C. Sheneberger, who comes from Twin Falls, registered as a new member of the Freshman class this semester.

Herman Baumann came to the School of Forestry in February as a Federal Vocational student. He was formerly employed in the Forestry Department of the State of Wisconsin. During the war he served with the 20th Engineers in France. Since his discharge he has worked with the Forest Service at the Priest River Experiment Station. He gave up this position to take advantage of the Federal Vocational training here.

At the close of the Ranger Course, Henry W. May left for the Idaho National Forest to resume his position as forest ranger.

Henry Nichol registered in the short course, but has taken up some long course subjects and will stay till the end of the term.

Paul Gerrard resigned as Forest Ranger last fall so that he might be able to attend college this winter. He has been reinstated and this summer will be in charge of the Musselshell Ranger District. He left about the seventh of April. Weippe, Idaho, will be Gerrard's address, as well as the address of Edward T. Nero and Harold E. Barto, who are going out on the Clearwater with Gerrard.

Ernest M. Martin (Ranger Course) is on fire patrol duty on the Weiser National Forest.

J. W. Stoneman and Francis Sheneberger are planning on spending their summer at their homes.

I. M. Massey (Long Course) left at the close of the short course for work with Henry May on the Idaho National Forest.

A party composed of Dean Miller, Dr. Schmitz, Frank A. Brown, Jas. W. Farrell, Ralph Space and R. E. Peterson is to make a forest reconnaissance of some state lands in the Clearwater conutry during the summer vacation.

Carl Brown, C. R. Core, Leslie E. Eddy, G. F. Ramsburg and Robert E. Leitch are going to work on the Selway National Forest the coming summer. C. E. Brockman will be a foreman of a construction crew, and Floyd M. Cossitt will be engaged in topographic work on the same forest.

Howard W. Staples and C. R. Patrie are going to work on the Coeur d'Alene National Forest during the summer months.

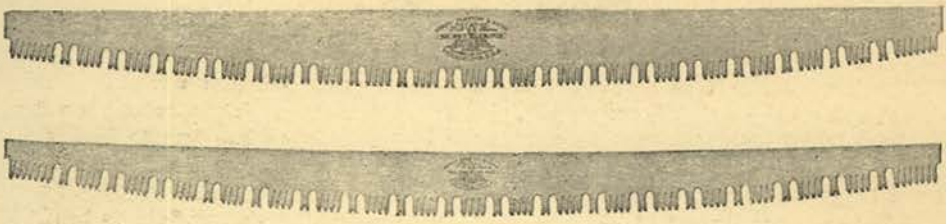
Fred Chamberlain will be located with the Blackman Lumber Mills at Coeur d'Alene.

J. P. Drissen will work for a lumber company at his home, Harrison, Idaho.

K. D. Edwards is foreman on road construction work near Pocatello, Idaho.

C. H. Gavin will assist his father in the management of a summer hotel near Yellowstone National Park. Ivan Melick plans to spend the summer on his ranch near Hailey.

William Byron Miller will be with a grazing reconnaissance party in Utah, and Jack Rodner is employed by the Clearwater Protective Association for the summer.



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