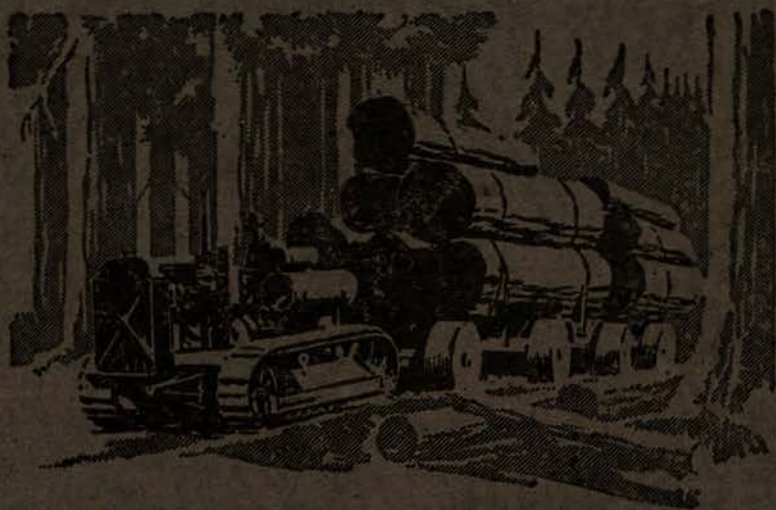




**The IDAHO
FORESTER**

Vol. IX,
1927



"Caterpillar" Power

... fits Many Methods

The usefulness of "Caterpillar" track-type tractors is not confined to any single system or method of logging. Sometimes "Caterpillars" supplant—often they supplement—other form of power.

Successful loggers apply "Caterpillar" power to skidding, yarding, loading, hauling. They use "Caterpillars" with high wheels, bummers, chutes, sleds or wheeled trailers.

Invariably the adoption of "Caterpillar" better, quicker, cheaper power reduces logging costs, increases production and profits.

Caterpillar Tractor Co.

Executive Offices: San Leandro, California, U. S. A.

Sales Offices and Factories:

Peoria, Illinois

San Leandro, California

Distributing Warehouse: Albany, N. Y.

New York Office: 50 Church Street

Successor to

BEST C. L. Best
Tractor Co.

The Holt Manufacturing Company **HOLT**

CATERPILLAR



Published by the Associated Foresters, University of Idaho, Moscow, Idaho 1927

VOLUME IX

ANNUAL EDITION

EDITORIAL STAFF

Editor	GALEN W. PIKE
Associate Editor	J. BERNAL BIKER
Business Manager	ROBERT DAVIS
Faculty Adviser	F. G. MILLER

CONTENTS

	Page
Dedication	2
Early Days in Forestry at the University of Idaho, by Dr. C. H. Shattuck.....	3
Private Forestry in Idaho, by A. D. Decker	5
The Idaho Forestry Law, by E. W. Renshaw	9
Forestry Education at Yale, by R. C. Bryant	12
Partial Cutting and Stimulated Growth in Western White Pine, by C. W. Watson.....	14
The Relation of the Viability of Seed to the Age of the Parent Tree, by Galen W. Pike..	17
The Better Utilization of Western White Pine Match Stock, by Fairly J. Walrath.....	19
Class of 1927	21
Alumni	21
Personal Mention	27
Dean Graves Visits the School	27
Series of Lectures by Gisborne	27
Geo. M. Cornwall, Another Notable Visitor	28
New Instructor in Forestry	28
Seniors Hear Mr. Hermann	28
Mr. Olson Addresses Foresters	28
Myrick Transferred	28
School Again Makes Good Record in Civil Service Examination.....	28
Trees on the Idaho Campus, by C. C. Price.....	29
Idaho Forest School Expands Its Nursery	32
The Associated Foresters, by Floyd W. Godden	33
What the Boys Will Be Doing This Summer	31
Foresters Hold Annual Banquet, by A. B. Hatch.....	35
Xi Sigma Pi, by Wilfred F. Beals	37
Seeding and Planting Trip, by Jackson Space	37
The New Extension Forester and His Job, by F. G. Miller.....	39
The 1927 Spring Cruise, by H. I. Nettleton	41
Forestry Along the North and South Highway, by C. W. Watson.....	44
Range Management Field Trip, by "Al" Coehran	46
Relative Moisture Content of River and Rail Logs by Wilfred F. Beals.....	47
A. W. Toole Appointed Deputy State Forester	55
How the Graduates Are Employed.....	56
Roster of Students	57



Dedication

IN GRATEFUL RECOGNITION OF THEIR
LOYALTY TO THE PROFESSION OF FORESTRY
AND OF THEIR SERVICE TO THE
GREAT CAUSE THAT PROFESSION
REPRESENTS, THE 1927 EDITION

OF

THE IDAHO FORESTER
IS RESPECTFULLY DEDICATED
TO THE

Graduates

OF

The School of Forestry
University of Idaho



EARLY DAYS IN FORESTRY AT THE UNIVERSITY OF IDAHO

By Dr. C. H. SHATTUCK *

It is a far cry across the years from 1909 to 1927, almost eighteen of them having slipped by since the first courses in forestry were offered at the University of Idaho. Many students and faculty members have come and gone since that opening day in September, 1909, when eleven students enrolled for the long course in forestry and the public wondered what it was all about. It was the writer's privilege to have had charge of these first courses, some of which are still maintained while others have given place to the more up-to-date requirements of present day forestry—far more practical than that of 1909.

Western Forestry in the Making

In those days forestry in America, especially in the West, could hardly be called a science, the work being so incoherent and incompletely organized that the outlining of courses of study in many of the subjects to be taught was a matter of great difficulty, and more or less of an experiment.

We had the theories of the European foresters and their text books, also some from the eastern part of our own country, but many of these were at the widest variance from the practices and conditions as we found them on the Pacific Coast, and we had to adapt and modify theories to suit conditions. Everything was different, especially size and species of trees, their diseases, insect enemies, methods of cruising, scaling, logging, manufacture, grades of lumber, etc. We therefore had to start from the facts as we found them in nature and the variable practices then obtaining in western forestry, and build up our courses as best we could, often changing them as we learned more of what was needed, in order to train our students to be good practical field and mill men. Our laboratories and class rooms were small and inadequate but our field, those "endless woods where rolls the Oregon" and its tributaries, was well nigh limitless.

Field Work

"Nature the old Nurse took the child upon her knee saying, 'Here is a book I've written

for thee.'" With this quotation as a slogan we went to the forests, the logging camps, and the mills to get the facts. There we learned to know the trees in their environment and the practices and methods of the western logger, cruiser, scaler, sawyer, grader, etc., and from this field work gradually our courses in forest protection, management, finance, and lumbering grew to be intensely practical, and the men taking these courses, and later going out to responsible positions have as a general thing ranked well and given good accounts of themselves, many of them still active in positions of responsibility with good prospects of further advancement.

Forestry at Idaho had to "Win Its Spurs"

Like every new course that has from time to time appeared in the curricula of American colleges and universities, Forestry was not looked upon with favor by some of the faculty and students of the old and well established courses. The forestry course was considered as more or less of a fad—an untried experiment—and its faculty and students were regarded as rather outside of the family of colleges. Both faculty and students had to stand the tests by which the other departments had earned the reputation, and standing which each enjoyed. In other words we had to "win our spurs" in scholarship and in general college activities—especially in athletics. We accepted the challenge and entered lustily into all kinds of college tests and activities. In a comparatively short time we were accorded the due respect and consideration of the older colleges, for both faculty and students "buckled in" with a "right good will" and where ever the department was represented it acquitted itself in such a manner as to impress everyone with its seriousness of purpose and its determination to do its very best at all times to make and hold not only a name for itself but to advance the interests and high standing of the University in every field where service could be rendered.

Opportunities on Every Hand

Opportunities were not lacking for such service, either on the part of the faculty or students. The professors (at first only one) were in demand as public lecturers at agricultural, lumbering, forestry, and general scientific and educational meetings and never

* To Dr. Shattuck, as its organizer and first directing head, credit is due for placing the Idaho School of Forestry on the sound basis which has made possible consistent growth and ever increasing influence in the promotion of forestry in Idaho. In his eight years of pioneering for forestry he rendered the state notable service.—Ed.

failed to respond, their efforts being very generally and generously well received. There was much hard work to be done on the faculty committees and here again they were found contributing all they could. In athletic and general student activities the forestry students were soon the recipients of many positions of responsibility, the records of the past revealing among the student leaders many names of Idaho Foresters.

The large lumber companies and the Forest Service at once began to try out both faculty and students to assist them in the vast amount of practical and theoretical work needing attention. So great was this demand, and so

ed themselves for registration in the forestry department in the early years of its existence. The records they have made amply testify to their sterling worth and high character. It is well known that in our universities many newly established departments fall heir to the ne'er-do-wells from other courses, but there was very little "switching" from the other courses to the forestry department when it was established, practically none coming from other departments for the reason above indicated. The writer could say much of a highly commendable nature of such fine boys, now almost middle aged men, as Fenn '11, Father of the present Idaho Forest-



Eastern White Pine, Age 16 Years, Pruned to Height of 7 Feet

urgent was the call to get at this work with the least possible delay that special permission was obtained each year to allow early "exams" in order that faculty and students could be in the field in early June. In fact it was not until the forestry department, as it was then called, began to have graduates that commencement week ever found a single representative remaining on the campus. We were all at work in the field and there we remained to the very last day before time to register for the next year's work, some even remaining one or two weeks after that date, making up the "back work" later.

Character of the Early Students

It is unnecessary to enumerate the many excellent and hardy young men who present-

ed themselves for registration in the forestry department in the early years of its existence. The records they have made amply testify to their sterling worth and high character. It is well known that in our universities many newly established departments fall heir to the ne'er-do-wells from other courses, but there was very little "switching" from the other courses to the forestry department when it was established, practically none coming from other departments for the reason above indicated. The writer could say much of a highly commendable nature of such fine boys, now almost middle aged men, as Fenn '11, Father of the present Idaho Forest-

(Continued on Page 46)

* Killed in France.

PRIVATE FORESTRY IN IDAHO

By A. D. DECKER, '13

Idaho may be classed with the typical forest states of the West. The beneficial influence which its forests exert in the economic, social and political structure of this commonwealth is apparent and of vital importance.

Lumbering industries of magnitude and communities dependent upon them have grown up in the timbered regions of the state. In the arid regions thousands of acres of desert land have been put under irrigation systems, the source of water for them emanating from forested watersheds. Following these irrigation developments numerous agricultural towns have sprung up.

The prosperity of this state—still in the pioneering stage of development—largely depends upon outside markets for the products of its mines, forests and fields. No industry brings in as much outside capital expended locally in wages and supplies as does lumbering. At the same time large revenues accrue annually to the treasuries of the state and its political subdivisions from its forest lands and timber industries. It is evident, therefore, that the future growth and welfare of Idaho will be greatly influenced by the perpetuation of its lumbering industries and the permanent productivity of its forest lands.

The Forest

A glance at a forest relief map of Idaho shows that approximately two-fifths of the total area were originally forest lands. This expanse of forest acreage spreads across the Panhandle in the north and extends from Canada to the sage brush areas at the lower and more arid elevations in the south.

At the present time statistics show forty-two per cent of the original area has been logged or burned. On the balance of the forested area it is estimated there are over eighty billion board feet of standing timber, much of which is remote and inaccessible. The great bulk of the remaining area is characterized by rugged divides and precipitous slopes, and consequently will carry high logging costs.

In lumber production Idaho ranks twelfth among the states, with an annual production slightly over one billion board feet. Over seventy-five per cent of the lumber manufactured is marketed out of the State, principally in the competitive markets of the East and Middle West.

Two commercially important forest types,

being exploited at the present time, give distinctive character to the lumber industry of Idaho, the western yellow or pondosa pine, occurring throughout the state as a foothill type, and the true white pine found only in northern Idaho. In addition to the Pondosa and white pine we find the less valuable "mixed species", viz., Douglas fir, white fir, larch, spruce, lodge pole pine, hemlock and cedar, occurring in various types and inter-mixed stands. These mixed species add greatly to the complexity of the problem from the standpoint of utilization as well as silvicultural practise.

Under present conditions these mixed species have but small stumpage value. However, they are being utilized by some operators to supply a certain market demand and also to assist in marketing the pine. At the same time the demand for these woods is being stimulated by forcing them on the market and new outlets are being developed. Generally speaking, they are marketed at a loss.

The wide diversity in types and stands further reflects the great variance throughout the state in topography, soil and climatic conditions. The differences in types and value in species emphasize the difficulty in prescribing, either by statutory regulation or otherwise, any one formula for forest management for the state in its entirety. Each stand of timber and every operation presents problems, both physical and economic, peculiar to itself which must be considered in arriving at a workable forest policy.

Forest Ownership

In casting about for a conclusion as to the source of Idaho's timber in future years, a consideration of the present ownership is of interest. Statistics show, on an acreage basis, ninety per cent of the forest land of the state belongs to the national government; three per cent is owned by the State; and seven per cent is in the hands of individuals and corporations. From the standpoint of merchantable timber, reports show the federal government holds but sixty-one per cent, the State nine per cent, and the individual and corporate ownership approximately thirty per cent. In contrast to the foregoing figures, eighty-five per cent of the present lumber production of the state originates from the lands owned by individuals and corporations.

It is with this private ownership that the public is most concerned.

The federal ownership is largely embraced in the nineteen national forests wholly or partly within the state. The administrative policy of the Forest Service is to manage its lands and conduct its timber sales on a sustained yield basis.

Trend of Forest Thought

Idaho, through its Forestry Law, which became operative in 1925, provided for the establishment of a state forester and a cooperative board of forestry. This was a progressive move and gives assurance of permanency in timber production on the forest lands belonging to the state. These lands, acquired by congressional land grants, include much valuable timber and sales therefrom follow well defined forestry regulations.

Within recent years there has been a marked shift in thought along forestry lines from the idea that reforestation was purely a responsibility of public ownership to the proposition that it should be undertaken as a private enterprise, or, more logically, as a voluntary cooperation between public and private interests.

Public attention is, therefore, being centered—not alone in Idaho, but in all timber producing states—on the private owner, his present methods of management and future policy, with particular concern being given to the increasing cut-over acreage. On the other hand—and of equal significance and concern to the private owner considering the adoption of a reforestation policy—is the general public attitude toward his property rights, cooperative forest protection and matters of taxation.

This awakened interest in forestry as a private enterprise is evidenced by the publicity given the subject in our newspapers, trade journals and forestry publications. Much time is devoted to the discussion of the problem in logging congresses, lumber manufacturers' conventions and forestry meetings. Forestry legislation is being proposed and voted upon. Women's clubs are studying the situation and grade school pupils are writing essays on the subject. The public is "sold" on the forestry idea generally, but the individual or corporation, in the embarrassing position of owning the acreage, has not been wholly convinced that the growing of timber as a business venture is a profitable investment for him or his principal's capital.

Forestry a Business Enterprise

All are agreed that forestry, whether practised by public or private enterprise, is a business proposition and must pay directly or indirectly. However, there are essential and varying conditions peculiar to each. It must pay the individual or corporation in terms of a satisfactory return on invested capital, or as a means of protecting and prolonging the life of investments in railroads, mills and equipment. It is not essential, however, that forestry practise as a public enterprise pay directly in terms of money value. If based on sound economics, it may pay indirectly in necessary provision for timber needs, in stream flow stabilization, preservation of scenic beauty and in stimulating recreational use of the forest.

In considering the private ownership within the State of Idaho and the future possibilities of permanent forest management, the fact must not be overlooked that Idaho, although large in area, has a small and scattering population. The 1920 census reports show an average of 5.5 persons to the square mile as compared to an average of 35.5 persons to the square mile for the United States.

Unlike many of our older and more densely populated states with good local markets for all kinds of timber products, Idaho has no timber tracts owned by individuals who—for commercial reasons, or being prompted by personal motives and pride in ownership—are practising well defined forestry methods. Neither are there large estates nor holdings by pulp companies and minor wood using industries such as typify exemplary forestry in the East where economic conditions are highly favorable.

In Idaho the most accessible privately owned forest lands are those held by lumber companies. These holdings are generally well blocked in large tracts, with occasional small intermixed acreages owned by individuals who are holding for speculation or awaiting developments in order that they may dispose of their timber to operators.

There is also an increasing acreage of "uncertain ownership" represented by individuals who—by reason of poor timber selections in unmerchantable and remote stands and the impact of increasing carrying charges—are becoming discouraged and letting these lands revert to the counties in default of taxes. These "tax bankrupt" lands are offered and reoffered at tax sales and in many cases sold and resold to speculators.

In this state, therefore, it is only reasonable to assume that, for some time to come, only such privately owned lands as are held by large lumber companies will be managed with any degree of thought given to future timber production. The interest taken by concerns in adopting reforestation programs will vary greatly depending upon the invested capital and the amount of stumpage ahead of the operation. For many, the turn in the tide will come too late.

To date, no company in Idaho has announced itself as having adopted a well defined reforestation policy working toward a continued operation. For some operators, the end is in sight. For others, such a program is possible on a limited production basis. Such announcements have been made in recent years by large individual concerns operating in the southern pine region of the South, the redwood and sugar pine regions of California, and the Douglas fir region of the Northwest. These regions, in contrast with the intermountain pine regions of Idaho, are particularly favored with ideal growth conditions—humid climate, mild and moist winters—and native species capable of rapidly responding to these favorable climatic factors. In these regions merchantable timber can be grown in one half the time required in Idaho. They also have the decided advantage of being close to growing industrial centers and tributary to tide water giving them the opportunities of water transportation and local as well as world markets.

Decided Tendency Toward Conservation

The fact that Idaho has not embarked upon an announced policy of forest perpetuation by private initiative does not necessarily imply that progress has not been made. Neither does it imply that the lumbermen of the State do not realize and appreciate the importance of the issue from the standpoint of future public welfare. They, perhaps, better than any other class of citizenry, realize the total dependence of many communities upon the continuance of a timber supply. Their livelihood depends upon it.

The majority of Idaho lumbermen have followed the industry westward. They have witnessed the cutting out of lumbering operations, the junking of mills and the abandonment of homes and communities. They have also observed the transformation of green timbered watersheds into blackened logged-off areas with the resulting decrease in stream flow. As a part of the lumbering communities, in

which they make their homes, they are vitally interested and are giving considerable thought to the problem.

Aside from the purely sentimental side of the picture, lumbering as stated is a business and, as such, it must be conducted along economic lines in accordance with sound business principles. Lumbermen who are entrusted with the management of the industry are directly responsible to their stockholders. Unless a fair margin of profit is made, capital will soon be dissipated and financing will stop.

Forestry, therefore, when considered as a private enterprise, involves not only the physical factors pertaining to forest crop production but also the equally important economic factors of profitable marketing, efficient utilization, adequate protection, operating costs and financial outlay in the form of initial and cumulative charges. As a business venture, these factors must be considered from the point of view of the present as well as the future. In application, forestry methods may be intensive or extensive, depending largely upon the varying economic conditions confronting the forester or operator.

The lumber industry in Idaho has made marked progress along lines of forest conservation. Today, in the better pine mills of the state with their modern milling machinery, dry kilns, remanufacturing plants, box factories and moulding departments, utilization and manufacture is refined to a point unsurpassed in any region. This refinement is also reflected in closer utilization in the woods.

New markets are being developed for the lower grades of lumber and the less valuable mixed woods. Attention is being given to standardization of grades and utilization of short lengths and advertising campaigns are being financed setting forth the merits of our various woods for the uses to which they are best adapted.

This progress along lines of manufacturing and marketing is gradually enhancing the value of stumpage and thereby hastening the day of more refined silvicultural practise.

Fire prevention is generally recognized as being the most urgent responsibility confronting the timber owner. Without adequate protection there is neither assurance that present stands can be saved and utilized nor is there any chance of fostering young growth. Experience has proved conclusively that the logged-off areas of Idaho will restock naturally,

as they did originally, if repeated fires are prevented.

In the timbered area of Idaho we have most difficult fire seasons and the worst fire risk and hazard of any timbered section of the United States. This is a region of dry summers, low relative humidity, disastrous lightning storms, rough topography and heavy slash and undergrowth. In meeting this situation, efficient cooperative timber protective associations have been organized. Idaho enjoys the distinction of being among the foremost of all States in this line of endeavor. The idea had its inception in northern Idaho over twenty years ago through the efforts of lumbermen and timber owners. The principles involved have been recognized and adopted throughout the nation. The bulk of the privately owned timber in the State is now embraced within well organized and well financed associations which are cooperating with federal and state agencies in all matters of forest protection.

While the fire problem still confronts us, the continued development of lookouts, roads, trails, telephone lines and use of air patrol are putting standing timber in the position where it may be considered as an insurable risk. Not only is merchantable timber being protected by these associations but cut-over lands and unmerchantable stands are receiving their proportionate share. It is pertinent to any forestry program that the logged-off areas be protected from recurrent broadcast fires.

Forest Investigations

Private forestry agitation in the past has been characterized by generalities, prophesying and a lack of definite information. This lack of fundamental knowledge is the result of our willingness to rely almost entirely upon the results of past failures and to continue along traditional lines of long established practise without making an effort to get at the fundamentals by systematic research.

A stage in the industry has now been reached when the situation calls for this line of endeavor. Lumbermen would like to believe in the ideals of forestry and are seeking more definite knowledge of costs and final realization. The Forest Service and forest schools are cooperating with operators along research lines. The Western Forestry and Conservation Association has included a research department to handle forestry problems for its contributing members. Private foresters are

also entering the field in Idaho to render this service.

Within the past year, two of the largest operators in the state have conducted studies under the supervision of trained foresters. An inventory of the lands was taken looking toward the possibility of adopting some sort of a forest policy with consideration being given to the restocking on cut-over areas, potential value and growth of residual stands, cutting systems and results obtained by various methods of slash disposal. These investigations show conclusively that the problems of slash disposal and prevention of recurrent fires are of prime importance, and, at the same time, the most perplexing in any forestry program adopted in Idaho. Nature is restocking these logged-off areas where given a chance.

The day of more refined forestry practise by lumbermen in Idaho has been greatly delayed by adverse conditions and economic factors tending to discourage any radical changes in management.

The lumber industry is highly competitive. Transportation developments have, in fact, pooled the immense timber resources of the nation with the result that woods from all regions are competing in the large markets of the East and Middle West. The bulk of the lumber produced in Idaho is shipped to these territories on a high rate of freight and sold in competition with woods from other regions reaching these markets on a lower freight rate and capable of being logged more cheaply. This is a serious handicap to profitable marketing.

On the other hand, we have the formidable competition offered by wood substitutes—fiber products, stucco, tile, brick, metal and concrete. These substitutes are rapidly being adapted to modern types of architecture and other uses formerly held by wood. The material used in the manufacture of a product—whether it be a home, refrigerator or a soap box—is generally of secondary importance to the item of cost. Substitutes are having a marked influence on the demand for and the price of lumber and will continue to have in the future.

Within the industry, conditions have been such the last year or so that profits have been nearly eliminated. In many cases, particularly operations manufacturing a large percentage of mixed woods and carrying large investments in timber lands, business has been done at a loss. While the volume of business

(Continued on Page 31)

THE IDAHO FORESTRY LAW

By E. W. RENSHAW, '25
Formerly Deputy State Forester

In commenting on the Idaho Forestry Law one should take into consideration the viewpoint of each class of citizen affected. A classification could roughly be made into (1) the lumbermen, (2) landowners of small acreage within a protective district, (3) the irrigationist, (4) the stockmen and (5) the public at large.

It is a pretty safe bet that if one were talking to a lumberman about the Forestry Law the main topic of conversation would be brush disposal, compulsory patrol and the powers invested in the State Forester. Talk to a stump rancher or small timber owner and you will be discussing the compulsory patrol feature of the law; if to an irrigationist, the value of timber on the watersheds and what benefits the law provides for this protection.

If we stop to consider the fact that of our forty-eight states only nine have not established some form of active forestry organization, then we can realize how important this form of legislation is. Public opinion is gradually forcing the issue and each state must work out its own solution to the problem.

The Fallon Fire Law

The Fallon Fire Law, enacted in 1907, was the first step in forestry legislation in this state. Briefly, this law provided for the establishment of fire districts, appointment of fire wardens, disposal of slashings, named a closed season, required burning permits and the use of spark arresters and gave police powers to certain officers for the enforcement of the act. The law was weak in some respects and it developed that in the main purpose of the law—the reduction of the fire hazard—it was decidedly inefficient.

Without going into the whys and wherefores of brush disposal, the writer wishes to state that he believes, in 90 per cent of the cases, the only proper manner to dispose of slashing in Idaho is by piling and burning. Broadcast burning was considered top form during the operation of the Fallon Fire Law and as a consequence thousands of acres were converted into legalized fire traps. However, with all

its weaknesses and inconsistencies, the Fallon Fire Law was an important step in forestry legislation in Idaho.

The Present Law

The present Forest Law was enacted March 5, 1925, and since that time has been subject to more comment possibly than any other law ever written into the statutes of Idaho. This law is too well known to require a repetition of its text. A great many have claimed that it was sponsored by, and passed for, the benefit of the large lumber companies.

This has been a form of argument used by not a few individuals and the compulsory patrol section has been cited as a case in point. It has been pointed out that small land owners are assessed forest protection charges



E. W. Renshaw

for the purpose of protecting the timber of the lumber companies. What grounds they may have had in making the above assertion is open to discussion. For example we may select an owner who has a timber claim which some day he expects to sell. It is quite probable that he has been holding this claim for years with this end in view, and each year the State and private agencies or the Forest Service have been giving his timber protec-

tion from fire with no reimbursement whatever from the owner.

The other example is the non-resident owner of cut-over, burned-over or other low value timber land. By reason of its menace to life and property, any fire burning uncontrolled on the above types of lands is considered a public nuisance. The lumber companies have thousands of acres of this kind of land on which they are now required to pay protection costs. It seems just that the law should provide that every owner shall furnish protection on his own land and that for failure to do so he shall be assessed the average cost of the protection provided.

It is true that some of the large lumber companies gave their support to the Forestry Law, but it is an error to assume that all of them did. At the present time a lumber company in the Panhandle of Idaho has entered into a suit against the State regarding the constitutionality of the law.

The last two years Idaho received Federal aid through the Clarke-McNary Law totaling approximately \$26,000 a year and it is expected to be about \$41,000 for the fiscal year of 1927. That this fund is available to Idaho is due principally to the rigid policy of protecting cut-over, burned-over and reproducing areas.

The main purpose of the Idaho Forestry Law is for the protection of her forest lands from fire. Twenty-four of its thirty-eight sections are specific in this provision and the remaining fourteen sections are closely correlated. It is a physical impossibility to keep all fires out of our forests, but we can, by education and legislation, reduce man-caused fires to a minimum. Furthermore, by keeping the cut-over land in a less inflammable condition we can give a crew a fighting chance to control a fire once started.

The Lumberman

That section of the Forestry Law which deals with brush disposal has been of prime interest to the lumber companies of Idaho. The lumber business is no exception as business enterprises go and must be operated at a reasonable profit. If piling and burning of slash adds such a cost to logging as to reduce profits very materially other disposal methods must be introduced. The piling and burning policy has been followed on National Forest lands in Idaho for a number of years. It is the recognized standard of the Forest Service. But, it is argued, the Forest Service deducts

the cost of disposal from the appraised price of their stumpage. While the State of Idaho does not deduct slash disposal costs from the appraisal yet it requires that all slash resulting from operations on state land must be piled and burned. This provision has been in effect since 1920 and the state has sold timber on this basis up to the present time.

Small Landowner

During the first two years that the law has been in operation it has been the subject of more or less criticism. Some of these criticisms were justified and some were not. To some extent, lack of funds hindered the classification of land and as a consequence a number of people were erroneously assessed for forest protection. Naturally these people felt they were being imposed upon and immediately let themselves be heard from. These were given individual attention and their assessments either cancelled or refunded, but nevertheless a certain amount of unfavorable opinion was started. You might say that in a majority of these cases the Forestry Law was forgiven but the fancied wrong remained a grievance.

Due to a misinterpretation of the law, certain other landowners felt that they were entitled to an exemption from protection charges. These were the ones who could not distinguish the fact that cut-over or burned-over land presents as great a fire hazard, and in many instances a far greater hazard, than green timber. The law says that all land which constitutes a forest fire hazard, whether the timber be living or dead, standing or down, shall be classified as "Forest Land" and given the same protection as merchantable timber. In order to insure a perpetuation of our timber crop and also to safeguard the present merchantable stand, fire must be kept from cut-over land. This entails an expense which must be met and non-resident owners are required to pay the actual cost of protecting such land which they may own. The bone of contention seems to be the relationship between hazard and value. Fire recognizes no differences and jeopardizes life and property indiscriminately on any type of area. On the other hand if the law proves itself confiscatory in this respect, remedial measures will have to be considered.

To relieve the burden on cut-over and burned-over land, a plan has been adopted by the State Cooperative Board of Forestry to apply Clarke-McNary funds exclusively to this type

of land so that non-members within Association boundaries will have their assessments on cut-over, burned-over and reproducing areas lowered to a maximum protection charge of 6 cents per acre.

The Irrigationist

Many articles have been written on the relation of the forests to the conservation of irrigation water supply. These articles are the result of extensive study covering a period of many years and show conclusively that a sustained stream flow on the lower levels are, to a marked degree, dependent on the vegetative ground cover in the mountains. To anyone relying on irrigation for the production of crops, the protection of Idaho's forests is of vital importance. In many instances timber which has a high protection value to stream flow has no value whatever commercially. It is fortunate that these protection forests are for the most part within National Forest boundaries and so have enjoyed protection which it is doubtful they would have received before the enactment of the present Forestry Law. The law now provides for such protection over the entire state.

The Stockman

The fact that within the forests of Idaho, over a million and a half head of livestock are grazed each summer indicates the importance of this forest range to the livestock industry. It is possible for fire to damage forage in several different ways. The surface fire, for instance, ruins the range for the year, it may even burn the grass roots thereby causing a further delay in the recovery of the range. The opinion held by some that summer range is benefited by fire because of the forage value of the fireweed which immediately appears, is not well founded. It is true that fireweed makes an excellent forage for sheep, but the fireweed is not a permanent plant. It comes for a year, or possibly two, and then disappears leaving the range much worse than before. Most everyone knows of the injury to browse caused by fire.

Burning Permits

Dissatisfaction has sprung up in a few localities over that part of the law which requires a permit to burn brush during the closed season. This criticism is entirely unjustified and viewed from an unselfish angle this section of the law discloses many good points. Getting a permit to burn reminds the permittee of his obligations in burning, thereby protecting adjoining property; it lets the

local fire warden know where and at what time the burning will take place so that he may keep his eye on it; it does away with any needless moving about of the protective organization personnel, and last but not most important of all it gives the fire warden a chance to refuse a permit if the hazard is too great for a brush fire at that time of the year.

The Public

What do forests mean to the people of Idaho? Why should every citizen be concerned in protecting them? Because lumbering ranks first among the manufacturing industries of the state thereby providing a home market for enormous quantities of farm products; it employs thousands of persons and pays annually a million and a half dollars in taxes. Furthermore, an obligation to future generations demands that we interest ourselves in the continuity of our timber supply.

The public at large should study Idaho's Forestry Law, should study the existing conditions which brought about its enactment, should recognize the stupendous importance of Idaho's forests to each individual within the state, and following this study, if the law is found superfluous or inadequate, constructive changes or additions can more intelligently be made.

It is well to ever keep in mind the Declaration of Policy of the State Cooperative Board of Forestry, which, in part, reads, ". . . that the said law shall be administered for the purpose of promoting reforestation so as to insure a continuation of the timber crop; of protecting the grazing areas of the State for the benefit of the livestock industry; of protecting the watersheds, which are vital to the success of farming, irrigation, water power development, and the continuity and purity of a domestic water supply; of providing for the proper disposal of brush and waste in timber operations, so as to reduce the recurring fire hazard to all forest land and other property adjacent thereto; and of fostering the business of the manufacture of lumber and lumber products;

BE IT FURTHER RESOLVED, That the said law, and the foregoing policies be administered with a due regard to the complete development of the material resources of the State, and the preservation of the health and property of its inhabitants."

FORESTRY EDUCATION AT YALE

By R. C. BRYANT

Professor of Lumbering, Yale Forest School

The School of Forestry at Yale was founded in 1900, through the generosity of Gifford Pinchot, Chief of the Bureau of Forestry in the Department of Agriculture, and other members of his immediate family. In his capacity as the directing head of Federal forest work, Mr. Pinchot visualized the need for a force of technically trained men who not only could educate the public to the urgent need for a forest policy for the United States but who also could develop and apply the principles of forest management. Previous to 1900 the only trained foresters in this country were a few men trained in European schools, the first forest school on the American continent being established in 1898 at Cornell University and the first graduating class being that of 1900. The Cornell school was closed in 1903 leaving the Yale School as the sole active pioneer in the field of forest education.

The Yale School of Forestry has functioned, uninterruptedly, as a graduate school, the entrance requirements calling for an undergraduate degree and a previous training in those collegiate subjects considered necessary as basis for a technical forestry training.

The original intention of the founders was to provide a training in professional forestry which would equip men chiefly for public service because at that time the greatest need for trained foresters was in that field. Public service then was represented chiefly by association with the Bureau of Forestry of the U. S. Department of Agriculture, and later with the Forest Service of the same Department. The contribution of Yale to national forestry is indicated by the service record of her graduates. Since 1898 the direction of Federal forestry in the Department of Agriculture has been in the hands of Yale men, Mr. Pinchot being succeeded in 1910 by Henry S. Graves at that time, and also since 1922, Dean of the Yale School, who in turn was succeeded in 1920 by W. B. Greeley, the present forester, a graduate of the school. Fifty-five per cent of all of the Yale graduates at some time or other have been connected, actively, with the Federal Forest Service and 20 per cent are now in that service. The graduates of the school have been instrument-

al in building up and administering many of the state forest departments and in still other states they have served or are serving as members of the technical forest force.

In forestry education, the backbone of every growing profession, Yale men have taken a prominent part serving not only as the directing heads of many of the forest schools but also as members of the faculties.

Students in the School of Forestry during the early years pursued a standard curriculum designed to give a general training which, on graduation, would prepare them for general forestry work or for later specialization in some particular phase of forestry. In recent years, a limited choice of electives has been made available to students in order that they may give more attention to subjects in which they may wish to specialize. It is not the policy, however, to permit the substitution of special courses for those subjects considered as fundamental in a thorough forestry training.

An increasing number of graduates of undergraduate forest schools have entered Yale in recent years to devote an additional year working for a Master's degree in Forestry. The question of whether an additional year in some institution is worth while from the students point of view has been discussed pro and con by the members of the student body of every forest school. The opinions on this subject of two men from widely separated undergraduate schools who recently completed their additional year at Yale is set forth in the April, 1926, issue of the Yale Forest School News.* The conclusions of these two men were that the degree of Master of Forestry was becoming each year more necessary as a qualification for forestry work and that the student who takes such an additional year's work should confine his efforts, chiefly, to some special problem calling for individual thought and effort.

These conclusions coincide very closely with the changes in educational policy inaugurated by the Yale School some years ago to

* Education Beyond the Four-year College Course in Forestry, by J. L. Averill, B. S. Cal. 1924, M. F. Yale 1926, Scandinavian Foundation Fellow 1926-27 and S. T. Huntting, B. S. F. University of Michigan, 1925, M. F. Yale 1926.

meet the needs of one-year students, namely, that such men should be encouraged to pursue special advanced work under the supervision of one or more members of the faculty, rather than reviewing general forestry subjects, in course. During the collegiate year 1926-1927 fourteen men are doing special work chiefly in silviculture, management and soils. Of this number two are from the University of Idaho. Facilities also are available for special work in forest entomology, forest pathology, soils, tropical forestry, and certain phases of forest economics.

The growth in the importance of research work in forestry has created a need for a greater number of men holding the degree of Doctor of Philosophy who have specialized in research methods. The school does not grant this advanced degree but candidates for it may register in the graduate school and major in some phase of forestry under the direct supervision of the Faculty of the School of Forestry. During the present collegiate year five men are so registered, who are chiefly engaged in a study of the plant sciences.

An essential to the proper conduct of advanced work is adequate library facilities and in this respect the school is well equipped. Its library contains much of the current literature on forestry and allied subjects and is especially rich in foreign literature, comprising books and, in some cases, complete sets of foreign forestry journals, which are invaluable to the research student. In addition the libraries of the other scientific departments and also the main University library are available for use by students in the School of Forestry.

Unrivalled facilities are offered for the study of forest management problems in the Eastern United States. The school not only owns and has under management typical areas of second-growth eastern white pine, hardwoods and eastern spruce, but there are available also the holdings of the New Haven Water company, some 12,000 in extent, which have been managed for more than twenty years under the direction of a member of the faculty.

Students without previous training in for-

estry who enter the School of Forestry as candidates for the degree of Master of Forestry must show satisfactory evidence that they have received an undergraduate degree in Arts, Science or Engineering and, in addition, have taken courses in the following subjects: at least one full year in Botany, including General Morphology, Histology and Physiology of Plants; at least one course in Zoology or General Biology, Physics, Inorganic Chemistry, Geology, Economics and Mechanical Drawing; Mathematics through Trigonometry; and French or German. Those who have not received a degree but have completed a minimum of three years of collegiate work, including the required subjects, also may be admitted to the general course provided they can show by certificate or examination that they have received the substantial equivalent of a college training.

Graduates from undergraduate forest schools also may be admitted as candidates for the Master's degree on the completion of one year of resident work. These men usually pursue advanced work and their fitness for admission is determined chiefly on the basis of previous training, scholastic attainments and the submission of evidence that they are fully equipped to carry on, successfully, the specific projects which they desire to undertake. Each case is considered solely on its own merits and arrangements with reference to matriculation must be made previous to the opening of the fall term.

The School has a limited number of free tuition scholarships and loan scholarships which are available to students of high character combined with excellent scholastic standing who are in need of financial assistance. The funds at the disposal of the School for these purposes are inadequate to meet the demand and application for such financial assistance must be made early in the second semester of the collegiate year preceding the students enrollment.

For some years the University of Idaho School of Forestry has been represented in the Yale student body by graduates who have done superior work and we hope that the close relations which now exist may continue in the future.

PARTIAL CUTTING AND STIMULATED GROWTH IN WESTERN WHITE PINE

By C. W. WATSON
Assistant Professor of Forestry

Occurrence of Western White Pine

Western white pine (*Pinus monticola*) in the United States is limited in its commercial distribution to northern Idaho as far south as the Lochsa divide on the Selway National Forest, and it also spreads out in the Flathead country of western Montana and in the Kaniksu region of north-eastern Washington. Here is the greatest body of white pine timber in the world. Its value as a wood is of the highest. This combined with its comparatively fast growth makes the species the one most to be favored in the forest management of this region, and its perpetuation will go far toward encouraging private forestry in north Idaho.

The Problem of Partial Cutting

The logging practices of the western white pine region have, until the present, favored clearcutting and broadcast burning. As a rule the logging left numerous small trees on the areas—the residual stand—these being considered too small to log, and these trees were always killed or consumed in the broadcast burning. The question was raised by foresters and lumbermen as to what this material left after logging would do in the way of growth if it were protected. It was pointed out that broadcast burning did not fireproof an area because, in disposing of the logging slash, the residual stand was killed, and it finally fell, forming a new fire hazard on the ground. In this way many of the broadcast burned areas have reburned many times until they have become brushy and barren. This condition resists complete forest reproduction for several decades.

Those interested favored a proper brush disposal, so as to leave the residual stand alive. This would make logged areas much less of a fire hazard because the brush had been removed, and the remaining green trees would shade the ground, delay the evaporation of moisture therefrom and help to prevent the occurrence of ground fires. They also expressed the belief that the residual stand would respond very quickly to the added light and soil moisture resulting from the removal of the larger trees by logging, and they predicted that this stimulated growth might furnish a good second cut within a few years.

Idaho now has a fire law which stipulates that logging slash shall be completely disposed of by piling and burning. This should solve part of the problem of partial cutting. To the Clearwater Timber Company of Lewiston, Idaho, and to the Idaho School of Forestry belongs the initiative in attacking the question of growth in residual stands of the Idaho white pine type.

The Clearwater Timber Company's Holdings

This company owns about 200,000 acres of the finest white pine timber in Idaho. They have just started to exploit their timber on a tremendous scale, cutting having started in the fall of 1926. Their holdings are solidly blocked, easily accessible by railroad, and the bulk of them lie just south of the North Fork of the Clearwater River in a region of rolling hills where the optimum growing conditions for white pine exist. This operation is of great interest to the forester, because the timber averages about 100 years of age—just such a stand as might result from forest management. Horse logging will be used, and this gives excellent opportunities for good forest practice. Furthermore, the company officials are very sympathetic with the idea of a sustained yield and the practice of forestry on their holdings. If private forestry can ever be practiced in Idaho, it should be preeminently successful here.

It is with the idea of informing themselves regarding the possible second cut from residual stands that the Clearwater Timber Company invited the Idaho School of Forestry to carry out the following investigation on their holdings.

The Purpose of the Study

To estimate, in advance of logging, how much timber of various sizes would be left by logging, cutting to an 11 inch diameter limit, i. e. all trees 11 inches and below would be left. The 11 inch limit was chosen because it would leave a good number of trees on the ground, and it was felt that it would not pay to log trees much if any below this limit. A second purpose was to predict what volume of timber could be cut from the residual stands after 35 years. The period of 35 years was chosen because of 35 year leases

which the company holds on some of the timber land.

The Time

The field work was done by the author and five assistants during the summer of 1926.

Methods

The strip cruise was adopted, basing the conclusions on the area actually cruised on the strips as a total rather than to apply them to each forty acre unit as a partial cruise. A strip $\frac{1}{2}$ chain wide was found to be most satisfactory. A wider strip was too much in the young, dense timber. Two strips were run through each forty, one in each half of the forty. On these strips all trees were tallied by diameter classes and species down

The Data

The data are presented in a series of seven tables. These tables are all based on a stand table, or average acre, of the entire area actually covered on the strips. In other words, we are dealing only with the timber actually measured—a 100% cruise.

Table one is the original stand table, showing the numbers of trees of the various diameters and species which would be found on an average acre of the area studied. It was compiled by dividing the total stand cruised by the acreage of the cruise. This gave rise to decimals which were retained to two places to promote accuracy in the event that the stand on a larger area might be desired.

Table I—The Original Stand
A Stand Table Showing Numbers of Trees Per Average Acre

D. B. H.	Western White Pine	White Fir	Douglas Fir	Cedar	Larch	Lodgepole Pine	Spruce	Totals
2	4.65	12.04	0.39	1.93	0.03	0.13	0.08	19.25
3	2.85	4.88	0.23	0.94	0.01	0.09	0.09	9.09
4	3.74	4.86	0.43	1.30	0.01	0.01	0.11	10.46
5	3.40	2.68	0.36	0.97	0.01	0.01	0.08	7.51
6	5.72	3.80	0.78	1.56	0.05	0.05	0.24	12.20
7	4.37	1.82	0.55	0.97	0.01	0.04	0.05	7.81
8	4.18	1.85	0.81	0.94	0.53	0.08	0.11	8.50
9	5.36	1.75	0.72	1.11	0.08	0.12	0.18	9.32
10	7.24	2.35	0.99	1.39	0.12	0.13	0.13	12.35
11	6.58	2.06	1.00	1.23	0.13	0.11	0.12	11.23
Total	48.09	38.09	6.26	12.34	0.98	0.77	1.19	107.72
Above is the residual stand								
The following will be removed by logging								
12	5.94	1.80	0.99	1.08	0.14	0.09	0.14	10.18
13	5.86	1.59	1.04	0.89	0.15	0.06	0.10	9.69
14	8.70	2.09	1.62	1.06	0.22	0.03	0.13	13.85
16	8.60	2.18	1.59	1.02	0.35	0.08	0.10	13.92
18	7.70	2.20	1.93	0.54	0.31	0.01	0.04	12.73
20	5.48	1.63	1.11	0.35	0.28	0.01	0.03	8.89
22	6.20	1.35	1.18	0.16	0.15		0.04	9.08
24	4.87	0.96	0.94	0.16	0.13			7.06
26	2.28	0.64	0.52	0.08	0.06			3.58
28	1.47	0.40	0.44	0.04	0.03		0.01	2.39
30	0.45	0.18	0.18	0.01	0.01		0.01	0.84
32	0.18	0.17	0.08	0.02	0.01		0.01	0.47
34	0.12	0.05	0.10	0.02				0.29
36	0.03	0.02	0.04					0.09
38	0.01		0.02					0.03
40		0.01						0.01
Total	57.89	15.27	11.78	5.43	1.84	0.28	0.61	93.10
Grand total	105.98	53.36	18.04	17.77	2.82	1.05	1.80	200.82

to a diameter of 2 inches. Calipers were used for diameters. The ages of the stands were obtained by taking three or four borings at the end of each five chain distance on the strip. Distances were measured by trailer tape and topographic abney.

Area Covered

The total length of strip run was 32 miles. This represents a 100% cruise on 128 acres and a 5% cruise of 4 sections,

The table is divided into two parts to show the residual stand and also that which is removed by logging.

Table one shows that in both the residual and in the logged stand the predominating species is white pine with white fir (*Abies grandis*) second. The cedar is *Thuja plicata*, the larch is *Larix occidentalis*, and the spruce is *Picea Engelmanni*. The white pine and the white fir are the most rapidly growing species

of the region from the view point of volume production. It is noteworthy that western hemlock (*Tsuga heterophylla*)—a common associate of white pine—here is absent. This seems to be the usual condition on a large part of the company's lands. These stands are just reaching maturity. They are mostly 80 to 100 years in age. Some small areas are

C tables of District I (western Montana and northern Idaho). An idea of the proper log lengths to use was obtained from measurements of trees felled along the railroad right-of-way which traverses the area studied. In the case of white pine, for example, it showed from one 16 foot log for a 7 inch tree to 10 logs for a 40 inch tree. No allowance is made

Table II
Showing Volumes in Board Feet Per Average Acre in the Original Stand

	Western White Pine	White Fir	Douglas Fir	Cedar	Larch	Lodge-pole Pine	Spruce	Totals
Residual stand	1,382.3	337.7	170.5	159.9	30.7	30.4	27.6	2,139.1
Logged stand	23,753.2	5,642.8	4,298.5	875.9	661.9	56.5	175.7	35,464.5
Total stand	25,135.5	5,980.5	4,469.0	1,035.8	692.6	86.9	203.3	37,603.6

60 to 80 years old, but these are of comparatively limited area. The forest is one which has arisen after an old fire—a condition encouraging a large percentage of white pine in the stand—and it is of great uniformity in composition and growth. The density is high and uniform, the trees are still making fine growth, and the site varies from I to II but

in the table for rot. There is very little decay in these young stands. It probably runs between one and two percent.

The total volume—37,603 feet—is low for a mature white pine stand growing on the best sites. This figure, however, is the average for four sections, and the stands are hardly mature. The maximum production on the

Table III
Table of Mean Annual Diameter Growth as the Result of Stimulation by Logging

Mean Annual Diameter Growth in Inches

D. B. H.	Western White Pine	White Fir	Douglas Fir and Larch	Lodge-pole Pine	Spruce	Cedar
1	0.18	0.16	0.18	0.16	0.18	0.18
2	0.18	0.15	0.16	0.14	0.17	0.17
3	0.17	0.14	0.14	0.13	0.16	0.16
4	0.15	0.15	0.13	0.12	0.16	0.15
5	0.15	0.15	0.12	0.11	0.15	0.15
6	0.16	0.16	0.11	0.10	0.15	0.14
7	0.18	0.16	0.11	0.10	0.14	0.14
8	0.18	0.16	0.10	0.09	0.14	0.13
9	0.19	0.16	0.10	0.09	0.14	0.12
10	0.19	0.15	0.10	0.08	0.13	0.12
11	0.19	0.15	0.09	0.08	0.13	0.12
12	0.20	0.14	0.09	0.08	0.13	0.11
No. trees	230	116	129	20	19	36

is mostly I. The forest floor is comparatively clear of underbrush.

Table II shows the volumes for the stand table, segregated into the volume to remain in the residual stand, the volume to be removed by logging and the total. In the residual stand 7 inches was taken as the minimum merchantable diameter. A top diameter of 6 inches was used. Volumes were figured with the aid of the Forest Service Scribner Decimal

best sites will run from 80,000 to 100,000 board feet per acre. From the point of volume in board feet, the material left in the residual stand is about 6% of the entire volume, and the same ratio holds for the white pine alone.

Stimulated Growth in the Residual Stand

Some difficulty was experienced in finding a basis for prediction of stimulated growth in the residual stand. A very meagre amount of

(Continued on Page 42)

THE RELATION OF THE VIABILITY OF SEED TO THE AGE OF THE PARENT TREE

By GALEN W. PIKE, '27

To determine the relation of germination capacity and energy to age in Western Yellow Pine, and to eliminate as far as possible all factors other than age which may affect this percent is the object of this paper.

Review of Previous Investigations

A French investigator, working with *Pinus silvestris*, fifteen, twenty, and twenty five years of age obtained no definite results to show the effect of the age of the parent tree transmitted to the seedling. (1).

E. N. Munns in working with *Pinus Jeffreyi* found no relation between the germination factor and the position in the cone from which the seed was taken. He found a decided decline in the germination percent with a decrease in the size of the seed. The seed from the lower part of the crowns germinated first.

G. A. Pearson has made numerous careful studies of yellow pine (*Pinus ponderosa*) in the Southwest on the Coconino and Tusayan National Forests with very interesting results. He found that the blackjacks gave a much higher germination percent (76%) than the yellow pine (68%). (2). Pearson applies the term "Blackjacks" to young, vigorous trees characterized by a dark, almost black bark. These trees are usually less than 20" D. B. H. and under 200 years of age. "Yellow Pine" he applies to the older trees characterized by a yellowish or reddish brown bark. These trees are usually over 30" D. B. H. and over 200 years of age. (3). Classifying the stand according to age, by decades, the germination percent was found to decrease with the increase in years. In a later experiment he found trees below 18" D. B. H. giving a germination percent of 82. 18"-24", D. B. H. giving 84%, 25"-30" D. B. H. giving 82%, and those over 30" D. B. H. giving 83%. In this experiment the relation of germination percent to age is not as definite as in the earlier experiment. (4).

Methods

The seed trees were selected from pure yellow pine stands on the Moscow Mountains, near Moscow, Idaho. These stands were all selected from the same site having a southwest exposure, a twelve to twenty degree slope and an elevation of 2500 feet to 2800 feet. The average annual rainfall here is twenty-two inches. The soil is decomposed granite with a thin mixture of Palouse silt loam, a loessal material.

As many trees on this site as could be found of each age class from 0-200+ bearing a normal supply of cones were chosen. Of this number it was necessary to reject those that were damaged or infected in any way, as by fire, lightning, mistletoe, insects, fungi, etc. Only healthy dominant trees with uniform crowns were finally retained and their seed taken. Extreme care was taken in this selection of the trees in order to eliminate all factors, except age, that might have an influence on the viability of the seed. In this manner it was hoped that a simpler comparison of the viability of seed of different aged parent trees could be obtained.

The cones were collected the last week in September. At this time the cones were open and the seed fully mature and beginning to fall. The trees were climbed with the aid of climbing irons and the cones picked from all parts of the crown. In some cases it was necessary to lop branches with a hand axe when the cones could not be reached otherwise. As the cones of each tree were collected, the age of the tree was obtained by use of the Swedish increment borer. The seeds were extracted from the cones by shaking them violently in a canvas, and filed with the number and age of the tree. From twenty-five to forty cones were taken from each tree, this being thought a fairly representative sample.

Germination Tests

The germination tests were made in the University of Idaho greenhouses. The beds were sterilized with steam to destroy any harmful fungi or bacteria that might be present and then dried and thoroughly pulverized, leveled and lightly rolled. No attempt was made to select the individual seeds to be tested, but light, small seeds were planted as well

1 "Experience on Pepinieres." Bul. Soc. Central Forest.
2 United States Department of Agriculture. F. S. Cir. 196. 1909

3 United States Department of Agriculture. F. S. Cir. 196. 1912.

4 United States Department of Agriculture. F. S. Bul. 1105. 1923.

as the larger ones. The sowing was done carefully by hand, 100 seeds in a row across the beds, and one half an inch of sand was applied over the beds to prevent them from caking and cracking. The beds were watered lightly daily to keep the soil moist. The temperature of the greenhouse was maintained at 68° F. as far as possible. During the month of December it was impossible to maintain this temperature due to the extreme weather and the condition of the greenhouse. For about two weeks the temperature was kept above freezing only with the greatest difficulty.

An inspection of this table shows an average germination period of ninety days, more than twice as long as the time required in investi-

to have a greater viability than that from any other aged parent. Up to this point the viability increased; beyond it, it decreased. This has a direct application in marking yellow pine stands for two or more cutting cycles. These trees, 140 year to 160 years of age, are the most desirable to leave for regeneration of the stand after cutting. The fact that the seed from those trees germinates sooner and more rapidly than that of the other classes in ordinary years is of little importance but in the extraordinary year, when the period favorable to germination is short, a start of a few days may mean the difference between some reproduction and none. It is in these unusual years that this increased germination energy is important.

Tabulation of Data—Comparative Viability of Western Yellow Pine—Idaho

Age Class	Duration of test (days).							Basis (Trees)	Average number of seed per pound
	50	60	70	80	90	100	110		
	Average germination per cent								
	No seed bearing trees found in this age class								
0-20	—	8	11	19	23	29	34(1)	5	11,230
21-40	—	—	10	21	28	39	45	4	
41-60	—	—	7	13	22	25	27	2	
61-80	—	—	13	20	27	31	32	3	
81-100	—	—	3	11	17	29	38	3	
101-120	17	21	24	36	51	62	64	5	
121-140	18	21	25	39	47	53	57	3	
141-160	—	—	—	—	—	—	—	4	
161-180	—	—	—	—	—	—	—	—	
200 -	9	14	19	31	35	38	43	2	

gations conducted by Pearson and by the Savanac Nursery. This is due to the low temperature of the greenhouse during the extreme weather in December, and possibly because the seeds require a short rest period after ripening. The inspection also shows the trees from 120 years to 160 years germinating first. These two age classes also give the highest germination percent. The germination percent has a definite upward trend until the parent trees reach an age of 120 to 160 years where it reaches its maximum. After this age is reached the germination percent decreases with an increase in years.

Summary

The seed of the trees from 120 years to 160 years old (14"-20" D. B. H.) was found

1 The youngest tree found bearing seed was 22 years old and gave a germination percent of 37.

The older trees yield larger quantities of seed, due to their larger crown space than the younger ones but this is offset by other factors. (2). The 140 to 160 year trees give a higher germination per cent. These trees also give a greater volume increase than the older trees and there is less danger of deterioration and loss before the next cut.

The age classes younger than 120 years to 160 years ordinarily need not be considered for seed purposes because of their small yield of seed and its lower viability. However, these younger trees may be of considerable importance in assisting to seed in blanks in the stand when older trees are not present.

For the above reasons western yellow pine trees from 120 years to 160 years of age are the most desirable to leave for regeneration after cutting.

2 U. S. D. A. Bulletin No. 1105.

THE BETTER UTILIZATION OF WESTERN WHITE PINE MATCH STOCK

By FAIRLY J. WALRATH, '27

The object of this study is to investigate the practicability of using blue stained material in the manufacture of matches.

There are two distinct groups of fungi which affect wood; namely, wood destroying fungi and stain fungi. It is the latter group with which this paper deals.

Blue stain, which is a blue and black discoloration, affecting the sap-wood of western white pine, does not impair the strength of the wood, but simply discolors the surface, or in severe attacks, discolors all the sapwood. (2) (4). The fungus causing these stains, germinates from a spore, and sends its thread into cells to feed upon starches and sugar, and other cell contents. The thread does not affect the cell wall in any way, so the strength is not impaired by the presence of the blue stain. The stain will start from a little patch and spread all over the surface, and if conditions are favorable, it will go all through the sapwood.

Warm weather and a comparatively high moisture content of the wood favor its growth. Freshly cut lumber that is piled without ample ventilation will cause the best growth of the organism. The fungus can remain dormant for a great length of time in dry boards and then start growing when the moisture content is sufficiently high to permit growth.

The stain may appear within a few hours after the boards are cut, the blue color being produced by the great number of minute threads in the wood tissue. After sufficient food has been collected, the fruiting bodies appear on the surface as hair-like projections. On close examination, each hair is found to have a swollen base in which the spores are produced. Boards showing blue stain when cut, should be piled so that drying will take place as rapidly as possible, in order to prevent further development within the board.

"Souring" of the sap or an acid condition is very conducive to the growth of blue stain fungi, so that dipping in an alkaline solution is one way of preventing its growth.

There are three ways of preventing the growth of blue stain: (3) air seasoning, kiln drying and treating with an antiseptic solution.

While air seasoning is the cheapest means of preventing blue stain, it is very subject to climatic conditions. The minimum time should be used in handling from the cutting of the tree to the piling of the lumber. Ample circulation should be provided for in order to get quick drying.

Kiln Drying

Kiln drying is the only effective method of preventing blue stain. 140° F. maintained for six hours at saturated atmosphere killed the fungus in one- two and four-inch stock. (1) (7).

Steaming, followed by air seasoning, has proven successful in some cases, but it may injure the product by causing case hardening.

Antiseptic Treatment

Sodium carbonate (soda ash) and sodium bicarbonate (baking soda) are the two most commonly used dips in this method of control, which consists in the mechanical or hand dipping of the stock as it comes from the saw, in a chemical solution. This method is not good during continuous rainy spells in the warmer months. A 4% solution of sodium carbonate (37% alkaline) should be used in the dry season, and an 11% solution during wet weather.

In using chemical dips, the following points should be kept in mind:

1. The solutions should be carefully mixed and concentrations kept uniform by means of a hydrometer.
2. The solutions should be heated when applied, the bicarbonate solution not more than 120° F.
3. The stock should be dipped as it comes from the saw.
4. Proper piling should be practiced so as to provide ample circulation in order to insure fast drying. (1) (3).

Method Used

The method used in securing information on the utilization of match stock was the questionnaire method, supplemented by a small amount of experimental work to determine whether blue stained wood could be bleached, and the chemicals that would be most economical. A questionnaire was prepared and sent to thirteen match companies in

the United States, and answers were received from ten.

The questions and digests of the answers are given in the following paragraphs.

Question 1

What are your objections to using blue stained stock for matches?

Eight of the companies answered "appearance." Some went on to explain that the public had been educated to getting a clean white splint and would not accept a mixture of colored ones at the same price. The Lion Match Company, a manufacturer of book matches, stated that they had no objection to blue stain stock and the Diamond Match Company stated that they were using, in certain brands, the small amount of blue stain that came in the match stock planks. Objectionable discoloration of the manufactured product seemed to be the main objection presented by the majority of the manufacturers.

Question 2

Could blue stained stock be used if dyed?

Nine of the manufacturers agree that it would be impracticable to dye the blued material for several reasons. It would be a rather expensive process to segregate the blued material from the clear, as they both appear in the same plank. A demand would have to be created for colored matches. Dyeing may impair the absorbing qualities in the further treatment and impregnation by the paraffin and other preparations.

The Lion Match Company is the one exception, again stating that blued stock can be used.

The consensus of opinion seems to indicate that it would not be practical or desirable to use blued splints after dyeing.

Question 3

Would a shorter length match stem be practical? What would you suggest?

At present there are several length matches on the market; namely, one and seven-eighths two and an eighth and two and three-eighths inches. The shorter length matches are suitable for smokers, etc., where a flame of shorter duration is desirable. But the fact that there are more full length matches sold than any other length, shows that the average person desires the stronger, longer splint, especially for lighting gas and fire, and for other general uses.

Question 4

What would you suggest for research that would be of practical importance and help to you?

This question is rather broad, and some of the replies were also broad. One company suggested research in all branches of the match industry, and another, no more research. But most of them suggested research along the line of finding a substitute for the present match wood. They claim that white pine is getting so high in price that they will have to turn to something less expensive. One other company suggested research to find a cheaper method of producing the chemicals. Another suggested the elimination of blue stain in lumber to make a great saving in utilization.

Question 5

Would it be practicable to develop a grade of matches, including blued stems only, perhaps at a slightly reduced price?

Most of the companies agreed that it would not be practical, saying that there were some grades of all blued splints on the market now, and they were not going well. Matches are such a cheap article that a slight reduction in price will not induce the public to change their demand. One of the companies said that they might be worked into the penny matches. Another company stated that the cost of segregation was prohibitive, but that a reasonable amount was being worked in at the present time.

Question 6

Any further comment, which is not already included, would be appreciated.

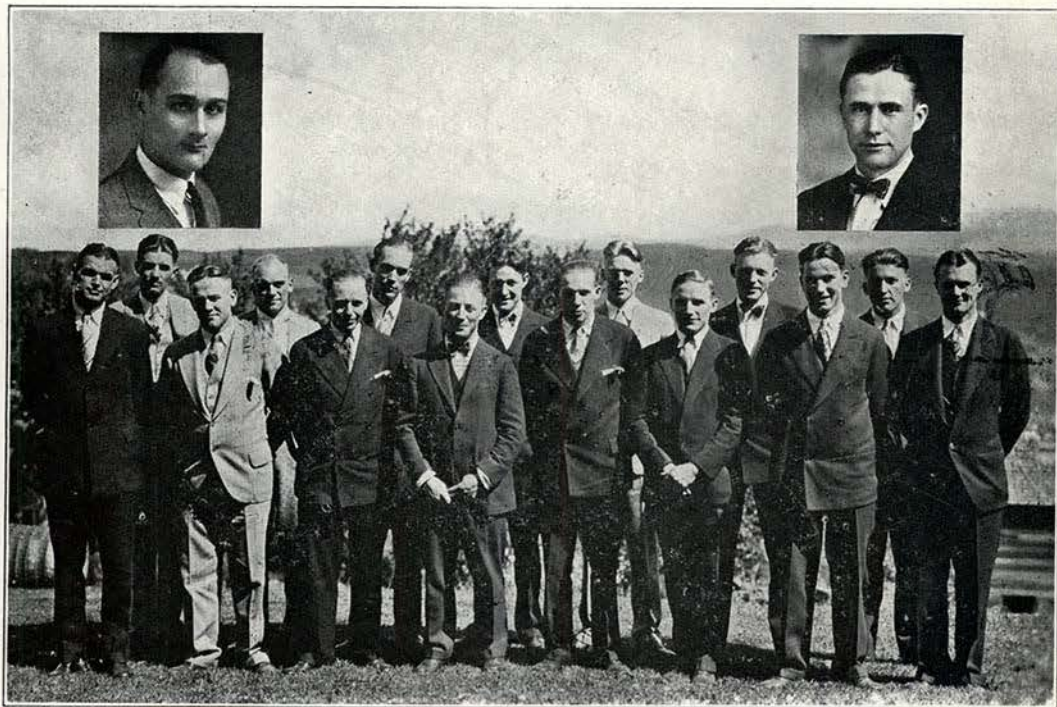
The Republic Match Company was the only one to give anything under this head. It went on to add that "there is a revolution or rather an evolution in firelighting means, like there is in everything else. We have the chemical lighters and various kinds of little devices which do away with the need of matches, and if lumber should be difficult to secure and matches increase in cost, these devices may supercede the industry the same as electricity has replaced the candle and kerosene lamp. Even our present day up-to-date auto has an electric cigar lighter."

Experiment to Bleach Blue Stained Stock

An experiment was made to determine if the threads of blue stain could be bleached by a dry gas and still not affect the wood. The splints turned white in about fifteen tubes and dry chlorine gas passed over them. The splints turned white in about fifteen minutes, but when left too long turned brown, indicating that a little of the moisture in the sticks united with the chlorine gas to form

(Continued of Page 38)

CLASS OF 1927



Front row, reading left to right: Sowder, Arthur M.; Phelps, Eugene V.; Beals, Wilfred F.; Lehrbas, Mark M.; Johnston, Royal H.; Godden, Floyd W.; Lansdon, W. H.; Walrath, Fairly J.

Back row: Greene, E. G.; Hoffman, H. C.; Callender, Wm. C.; Burroughs, I. C.; Gustafson, Carl A.; Williams, Guy V.; Space, Jackson.

Left insert: Pike, Galen W. Right insert: Toole, A. W.

Sowder becomes Extension Forester to Idaho; Beals, Godden, Pike, and Gustafson have accepted appointments in the Forest Service, through the junior forester examination; Toole also qualified through the same examination but declined an appointment to accept the office of Deputy State Forester; Lehrbas passed the examination for junior range ex-

aminer, but will travel several months before taking an appointment; Phelps, Johnston, Walrath, Greene, Callender, Space, and Williams have all accepted employment with the Clearwater Timber Company; Lansdon takes employment in the mill at Potlatch, Hoffman is to be with the office of Blister Rust Control, and Burroughs will be in military service at Camp Lewis, till August 1st.

ALUMNI

BAUMANN, HERMAN, B. S. (For), '24.

Since graduation Mr. Baumann has been employed as Forester to the Fruit Growers Supply Company, Susanville, Calif. That company is building up a forest policy which Mr. Baumann believes will stand the test of present day economics. The company, with the aid of the Forest Service, expects to place its holdings under permanent management.

BEDWELL, JESSE L., B.S. (For), '20.

After leaving Idaho Mr. Bedwell did two years of graduate work at Oregon Agricultural College from which he received his M. S. degree in June, 1924. Later he was transferred from the Forest Service to the Bureau of Plant Industry. Mr. Bedwell has been there since as assistant pathologist. His address is 618 Realty Building, Spokane, Wash. Some

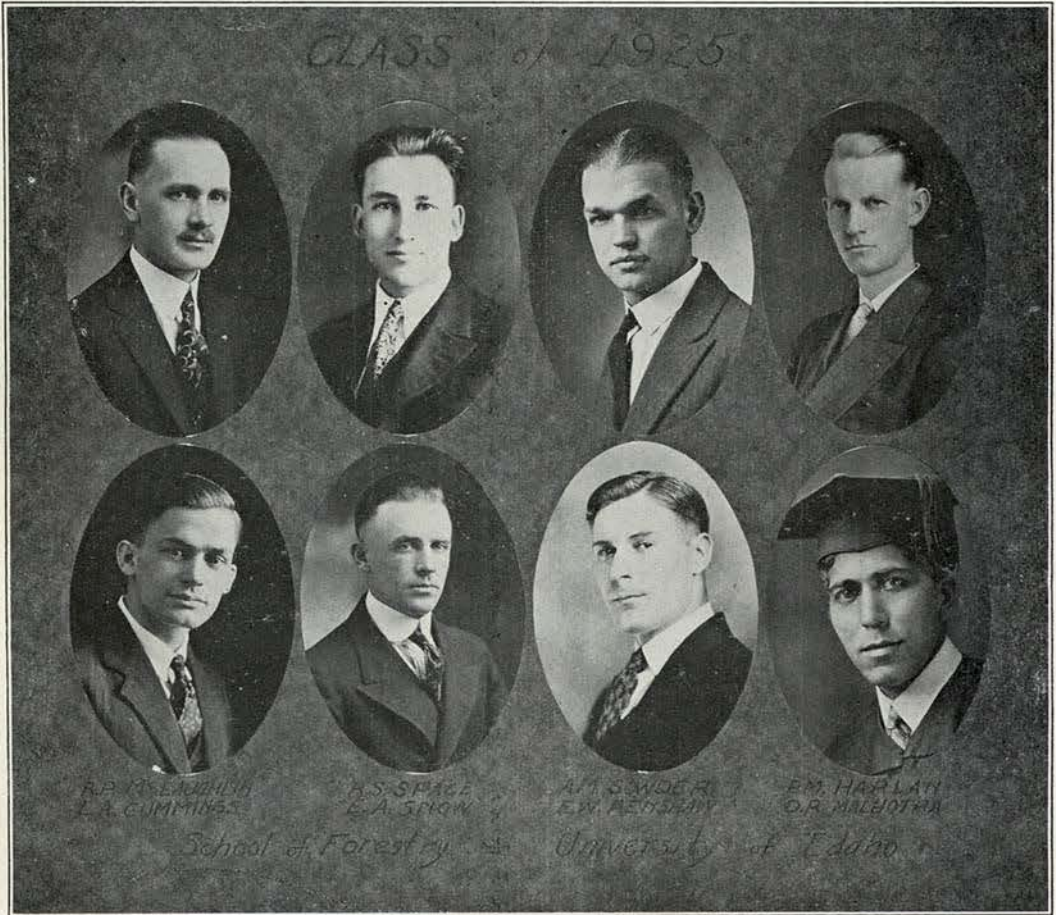
time ago he married Lois R. Jones, Idaho student ex '17. He boasts of two fine daughters. BOLLES, WARREN H., B.S. (For), '26.

Mr. Bolles is with the Forest Service at McCall, Idaho. Since graduation he has been working on management plans for the Service, and has just completed a management plan for the Meadows Valley Working Circle. He will now have charge of the South Fork Salmon Ranger District.

CARLSON, OSCAR F., '15. Deceased.

CRUZ, EUGENIO de la, B.S. (For), '26

Mr. Cruz took his Masters Degree from the Yale Forest School this June. Part of the summer he expects to work in Michigan for Henry Ford and then he gives his address as Lingayen, Pangasian, Philippine Islands. Mr. Cruz this spring passed the civil service for the position of junior forester.



BROWN, FRANK A., B.S. (For), '22.

In June 1924, Mr. Brown married Pearl Stalker '24. He later entered the College of Dentistry, University of Southern California from which he was graduated this June. He writes "the principle of leverage which I learned while handling a peavy in the Idaho woods has helped me a great deal in mastering the technique of manipulating extracting instruments". His permanent address is given as 308 State Street, Boise, Idaho.

CUMMINGS, LEWIS A., B.S. (For), '25

Since graduation Cummings has been with the U. S. Forest Service and is now Junior Forester on the Holy Cross National Forest. His address is Glenwood Springs, Colorado. He spent the winter on a timber reconnaissance in Minnesota.

CUNNINGHAM, RUSSELL N., B.S. (For), '17

Mr. Cunningham is at present with the U. S. Forest Service, Missoula, Montana. His title is Inspector—Fire Cooperation for District

One. His report reads "daughter, born December 1925." Russell is highly respected in forestry and lumbering circles.

DANIELS, ALBERT S., B.S. (For)., '23

Mr. Daniels is now chemist for the Southern Pacific Lines, looking after the wood preservative work of the company on its eastern division. He married Margaret Macey of the class of 1924, June 18, 1924. He tells us he has had little opportunity to see any of the Idaho boys. He recently met Mr. E. O. Siecke, Texas State Forester, who was a student of Dean Miller at one time. Mr. Daniels gives his permanent address as Box 61, Mail Room, Southern Pacific Bldg., Houston, Texas.

DECKER, ARLIE D., B.S. (For)., '13; M.F. Yale '17

Mr. Decker served for three years as instructor in forestry, University of Idaho, and for one year as head of the department of forestry, Washington State College. He was then called by the Potlatch Lumber Company to accept the position of land agent. Later he was placed in charge of the company's extensive cedar pole business with headquarters at Potlatch, Idaho.

DOYLE, IVAN S., B.S. (For)., '26

Altho Mr. Doyle left the school only last year, he is already well established in his work with the Clearwater Timber Co., with headquarters near Pierce, Idaho.

DRISSEN, JOHN PHILLIP, B.S. (For)., '21

After serving for several years as deputy supervisor of forests for the U. S. Indian Service with headquarters at Dulce, New Mexico, Mr. Drissen resigned May 2, to accept a similar appointment on the Yakima Indian Reservation with headquarters at Toppenish, Washington.

FARRELL, JAMES W., B.S. (For)., '22

Farrell is assistant supervisor on the Idaho National Forest with headquarters at McCall, Idaho. He has won distinction for his work on timber sales and management plans.

FAVRE, CLARENCE E., B.S. (For)., M.S. (For)., '15

Mr. Favre has been with the U. S. Forest Service since he was graduated, starting in as assistant forest ranger in Wyoming. Since then he has held the positions of forest ranger, grazing assistant, deputy supervisor, and is now forest supervisor with headquarters at Kemmerer, Wyoming.

FENN, LLOYD A., B.S. (For)., '11

Altho a forester at heart Mr. Fenn is at present an attorney-at-law at Kooskia, Idaho.



Hon. Lloyd A. Fenn

After leaving school he took employment with the Forest Service but later prepared himself to practice law. Fenn has served several terms as a member of the Idaho legislature where he did outstanding work in securing passage of the Idaho Forestry Law.

FIELD, WALTER D., B.S. (For)., '26

General construction work is keeping Mr. Field out of mischief. He is with the Clearwater Timber Company at Pierce, Idaho, and is making excellent progress in his work.

GERRARD, PAUL H., B.S. (For)., '23

At present Mr. Gerrard is assistant forest supervisor of the Clearwater National Forest with headquarters at Orofino, Idaho. He took employment with the Forest Service immediately after he left college, where his work has won him consistent advancement.

GILLHAM, NORMAN F., B.S. (For)., '26

The past year Mr. Gillham has spent in his home community in Illinois but returned to the west this spring to locate permanently in forestry work. Incidental to his return, his engagement was announced but he refuses to tell when the wedding will occur. Mr. Gillham has accepted employment with the Clearwater Timber Company, Lewiston, Idaho.

HARLAN, PAUL M., B.S. (For), '25

Mr. Harlan holds the position of secretary-treasurer to Gas Appliance Society. His address is 54- Powell Street, San Francisco.

HERMAN, CHAS. H., '13

(Will someone please report his address).

HUNTINGTON, COLLIS H., (For), '26

Immediately after graduation, Huntington accepted employment with the Northern Rocky Mountain Forest Experiment, Missoula, Montana.

JACKSON, TOM, B.S. (For), '19

Some men are busy and others busier. Mr. Jackson comes in the latter class. He spent one hour in Moscow June 1 on his way to Spokane. He is woods superintendent for the Fruit Growers Supply Co., at Susanville, Calif.

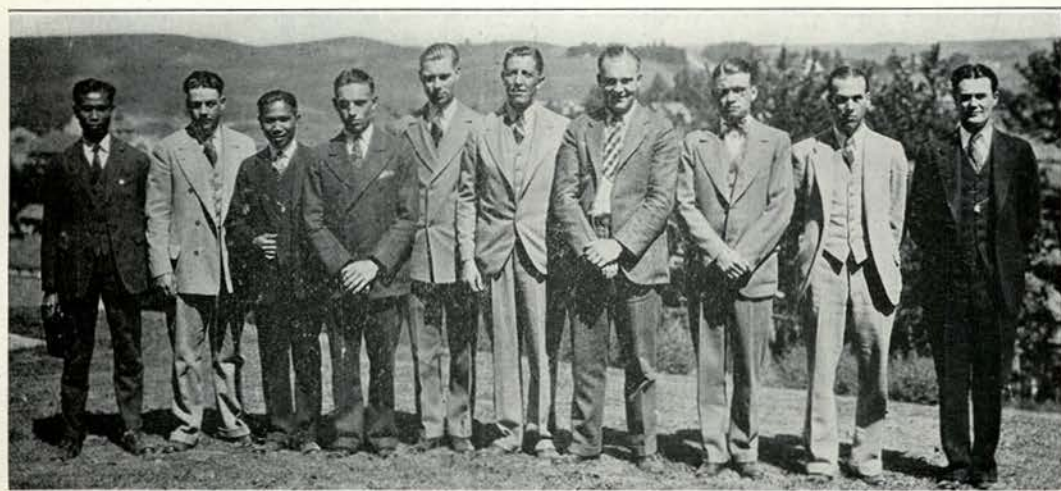
agement" in the University of California. His address is 1715 Francisco St., Berkeley, and he has the title of assistant professor of forestry.

**McLAUGHLIN, ROBERT P., (For), '25.
M. S. Yale, '26.**

McLaughlin is assistant professor of forestry, Michigan State College, Lansing.

**MELICK, HARVEY IVAN, B.S. (For), '23.
Nampa, Idaho.****MILLER, WILLIAM BYRON, B.S. (For), '22.
M. S. (For), California '25.**

Mr. Miller is with the U. S. Biological Survey on reindeer investigations at Fairbanks, Alaska. He was married to Attie Johnson of Richfield, Utah, in Salt Lake City, on May 15, 1925. He has been in Alaska since June, 1925. Mr.



Class of 1926

Left to right: Sajor, Huntington, Cruz, White, Pugh, Field, Olson, Bolles, Doyle, Walrath.

Then too he is occupied with more or less general managerial work.

LUNDSTROM, F. J., B.S. (For), '11

Mr. Lundstrom is employed by the road department of Los Angeles County, California. He gives his address as 1631 N. Harvard Blvd., Los Angeles.

MALHOTRA, DES RAJ, B.S. (For), '25

Mr. Malhotra holds the important position of Assistant Conservator of Forests to the State of Kashmire, India. His address is Jammu, Kashmire State, India.

MALMSTEN, HARRY E., B.S. (For), '17

In Mr. Malmsten's report he has the notation "unmarried and teaching courses in forest protection and advanced range man-

agement" in the University of California. His address is 1715 Francisco St., Berkeley, and he has the title of assistant professor of forestry.

MOODY, VIRGIL C., (For), '17.

He has been in the Forest Service continuously since graduation and his address is U. S. Forest Service, Coeur d'Alene, Idaho.

MUNSON, OSCAR C., B. S. (For), '21.

Munson is district plant engineer of the northern portion of the coast division of the Pacific Telephone and Telegraph Co. with headquarters at Santa Rosa, California. His home address is 814 Spring Street. He speaks

in particular of the scenic attractions of the Redwood Highway.

NERO, EDWARD T., B. S. (For)., '23.

Business is at present occupying the time of Mr. Nero. He resigned from the U. S. Forest Service a few years ago to go into the store business. His address is Orofino, Idaho.

OLSEN, CLARENCE C., B.S. (For)., '26.

District Ranger is the title Mr. Olsen has with headquarters at Crescent, Oregon. He reports little to do except take care of 400,000 acres of land in his district. Among his duties he mentions marking and scaling timber, timber sales, logging damage studies, land-exchange, surveying the site for Crescent, in charge of eleven sheep and one cattle allotments, three summer resorts, besides innumerable homesites and as "Ole" says "Irish lumberjacks to the north, sagebrush settlers to the east, Klamath Indians south and a forest with nearly 100% Scotch personnel to the west. What chance has a poor Swede got?" Mr. Olsen was married last September to Jeannette Greve, a former Idaho student.

PARSONS, RUSSELL M., B. S. (For)., '24.

The Clearwater Timber Company is taking all of Mr. Parson's time. He is a timber cruiser and camp draftsman, and is making excellent progress in his work.

PATRIE, CARTHON R., B. S. (For)., '22.

After Mr. Patrie graduated he entered the Bureau of Plant Industry (Blister Rust Control) but left this work to enter the Indian Service with headquarters at Klamath Agency, Oregon, where he is now located. His title is that of forest assistant. He was married in 1922.

PUGH, LAWRENCE R., B. S. (For)., '26.

Immediately after Mr. Pugh received his degree he began selling lumber, box shooks, etc. His permanent address is Springston, Idaho, but he travels over Idaho, eastern Washington, Utah, Colorado, Wyoming and Montana.

RENSHAW, EMERA WILFRED, B.S. (For)., '25.

For two years after graduating Mr. Renshaw served as deputy state forester to Idaho and only this spring resigned to accept an appointment with the U. S. Forest Service with headquarters at St. Maries, Idaho.

RETTIG, EDWIN C., B. S. (For)., '19.

Mr. Rettig is one who has had considerable experience since graduating. He served as a surveyor and draftsman for the U. S. Forest Service one year, assistant fire warden to the

Clearwater Timber Protective Ass'n., also and later cruiser for the Clearwater Timber Co. At present he is land agent for the latter company and his report includes the notation "married."

RUCKWEED, FRED JOHN, B. S. (For)., '17.
Gettysburg Public Schools, Gettysburg, South Dakota.

RYAN, CECIL C., B. S. (For)., '24.

The headquarters of Mr. Ryan are Moscow, Idaho, where he is employed in the office of the city surveyor.

SAJOR, VALENTIN, B. S. (For)., '26, M. S. Yale '27.

Mr. Sajor is planning to spend a few months in Michigan on the Henry Ford operations before he travels back to his home in the Philippine Islands. This spring he passed the civil service examinations for both junior forester and junior range examiner.

SCHOFIELD, WILLIAM R., B. S. (For)., '16.

Topographic engineer and fire chief to the Hammond Lumber Company, Samoa, California, is the present title of Mr. Schofield. He has had a great deal of experience in the engineering field since leaving college besides grazing experience, military work and even engaged in private business. December 28, 1920 he was married to Elizabeth McMillan and they have one son.

SHARMA, PARMISHIRIE DAS, M. S. (For)., '22.

Technical Adviser, Forest Branch, State of Gwalior, India. This is an office of high rank.

SNOW, ELVA A., B. S. (For)., '25.

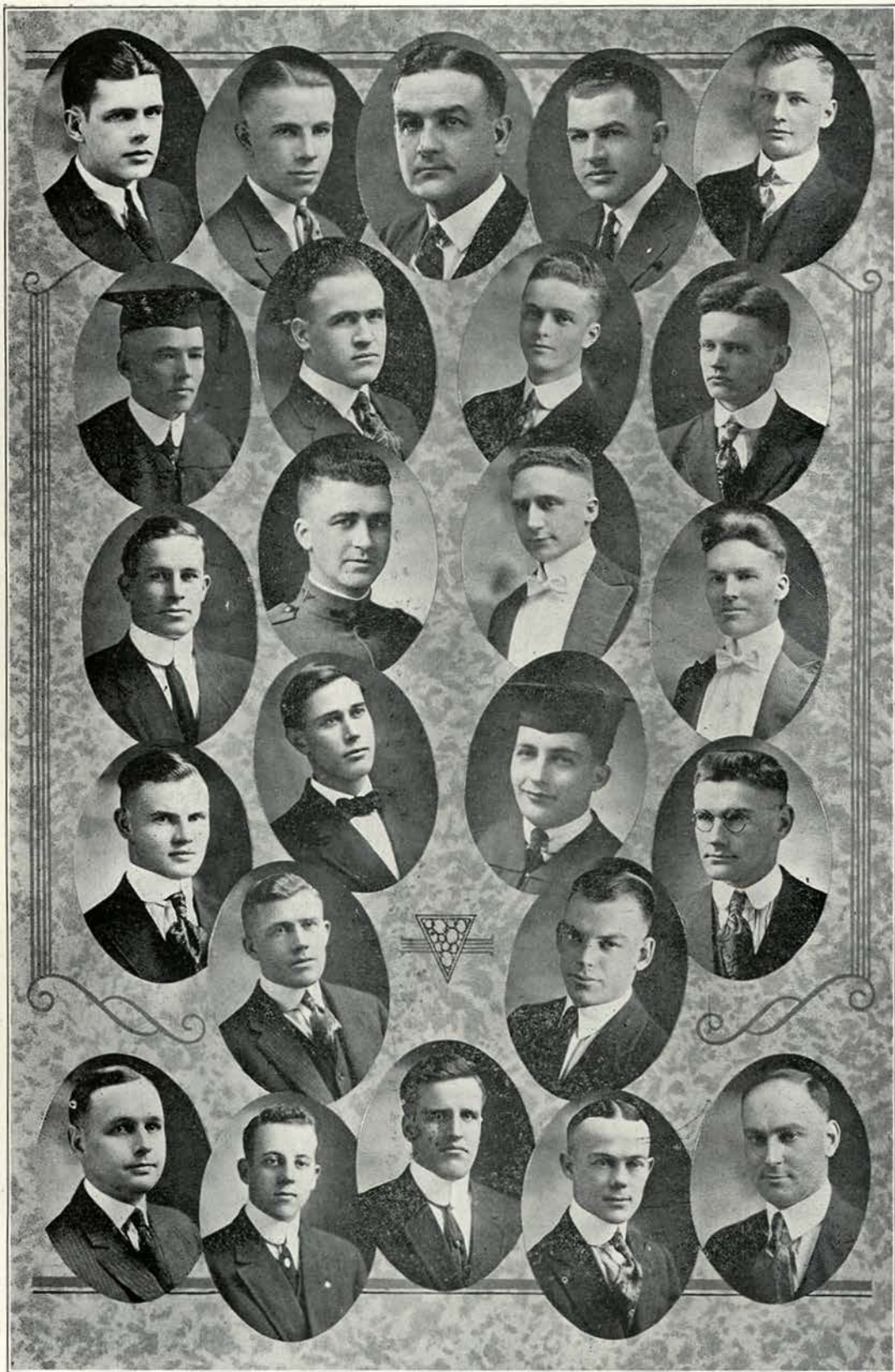
Mr. Snow is with the Forest Service and holds the position of junior forester. Since leaving school he has been doing timber sale work on the Medicine Bow National Forest at Albany, Wyoming.

SOWDER, ARTHUR M., B. S. (For)., '25, M. S. (For)., '27.

After graduating Mr. Sowder returned to the Edward Rutledge Timber Company logging operations near Clarkia, Idaho, and left there last fall to return to Idaho to complete his work for the Master's degree which he received this June. Only recently Mr. Sowder accepted the appointment as Extension Forester to the State of Idaho and will have his headquarters at Moscow.

SPACE, RALPH S., B. S. (For)., '25.

Mr. Space is a forest ranger at present on the Blockfoot National Forest with headquarters at Kalispell, Montana.



GROUP OF ALUMNI— (See Page 27)

Group of Alumni—(See Page 26)

- First row (top) reading left to right: Wheaton, R. G., '24; Gilham, Norman F., '26; Decker, A. D., '13; Bauman, Herman, '24; Yates, Donald H., '17.
 Second row from top: Malmsten, Harry E., '17; Brown, Frank A., '22; Schofield, W. H., '16; Cunningham, Russell M., '17.
 Third row: Lundstrom, F. J., '11; Staples, Howard W., '20; Nero, Ewart, T., '23; Miller, W. Byron, '22.
 Fourth row: Rettig, E. C., '19; Wadsworth, H. A., '11; Patrie, C. R., '22; Drissen, J. P., '21.
 Fifth row: Jackson, Tom B., '19; and Parsons, Russell M., '24.
 Sixth row (bottom): Daniels, A. S., '23; Bedwell, J. L., '20; Favre, C. E., '14; Ryan, C. C., '24; Gerrard, Paul H., '23.

STAPLES, HOWARD W., B. S. (For), '20.

Mr. Staples, after serving several years as resident manager of the Yukon Gold Company at Murray, Idaho, recently signed and will return to the Forest Service. His address is Moscow, Idaho.

STEVENS, ARTHUR W., B. S. (For), '11.

Mr. Stevens is now with the Anaconda Copper Mining Co., as surveyor and draftsman, at Great Falls, Montana. His Company is making a detailed survey of its equipment and buildings and he tells us the project covered a six months' period.

WADSWORTH, HERBERT ALONZO, B. S. (For), '11.

Major, U. S. Infantry, Fort Howard, Maryland.

WHEATON, RODGERS G., B. S. (For), '24, M. F., Yale '25.

Mr. Wheaton accepted an appointment with the U. S. Forest Service immediately after

leaving Yale but more recently he has been employed in the capacity of a district forester, by the North Carolina forestry division. His present address is 316 Jackson Building, Asheville, North Carolina.

WHITE, HAROLD Z., B. S. (For), '26.

After graduation Mr. White entered the employ of the Clearwater Timber Company at Pierce, Idaho. In January he was sent to study kiln drying of lumber at the Potlatch Lumber Company so that he could take charge of the kiln drying operations of the new Clearwater Timber Company's mill which is under construction. In the early part of June he made a tour of inspection of some of the large mills on the Pacific Coast.

YATES, DONALD R., B. S. (For) '17.

Yates is flourishing in the real estate business with headquarters at 714 Holland Bldg., Seattle, Wash.

YOUNGS, HOMER S., '17. Deceased.**PERSONAL MENTION****Dean Graves Visits the School**

We were greatly delighted with a visit from Dean Henry S. Graves of the Yale Forest School, on April 26th and 27th. He addressed the School of Forestry, including the faculty, student body, and several invited friends from out of town, the morning of April 27th upon his impressions of the field and opportunity of the forester. He cited as an example of what the forester may do to create favorable sentiment for forestry, the roadside planting now being done in Connecticut as the result of organized effort on the part of Connecticut foresters. Incidentally, one of the results is the driving of the obnoxious bill board from the public highway, for with trees placed at intervals along highways, bill board advertising becomes undesirable. In short, what Dean Graves wanted to impress upon his hearers was that often work seemingly not

germane to forestry, may be of greater importance in promoting forestry than work along strictly conventional lines.

Dean Graves held two conferences with the forest faculty during the course of his visit, in which matters of policy in forestry education were discussed, as well as the part the forest schools should play in forest research.

He was the principal speaker at the noon luncheon of the Moscow Chamber of Commerce, and had given the main address at a community banquet in Lewiston the evening before.

Series of Lectures by Gisborne

In March, last, the School of Forestry enjoyed a series of lectures by Mr. H. T. Gisborne, silviculturist of the Northern Rocky Mountain Forest Experiment Station. He touched upon a variety of subjects, but

throughout his series, he stressed the importance of forest research as a factor in the solution of many of our forest problems. The course was most favorably received.

Myrick Transferred

Mr. E. H. Myrick has been transferred from the forest supervisorship of the Lewis and Clark National Forest at Chateau, Montana to the forest supervisorship of the St. Joe National Forest, with headquarters at St. Maries, Idaho.

New Instructor in Forestry

With the opening of the year last September, a new instructor in forestry, in the person of Mr. E. G. Wiesehuegel, was added to the staff, making five men giving full time to the work of the School.

Mr. Wiesehuegel comes to his new position with a good background in both training and practical experience. He was graduated from the School of Forestry, University of Michigan, in 1922 with the degree of Bachelor of Science in Forestry, but had meanwhile completed



E. G. Wiesehuegel

several months of post graduate work. In recognition of his proficiency in botany he was elected to membership in the Phi Sigma, National Honorary Biological Society.

Soon after graduation, Mr. Wiesehuegel accepted an appointment from the U. S. Forest Service and was assigned to various fields of

work from time to time, in District 4. In his first year with the School of Forestry, he has proven himself to be an excellent teacher as well as a man of more than ordinary promise in forest research. The School is fortunate in securing his services.

Seniors Hear Mr. Hermann

On the morning of April 13th, the seniors listened to an address by Mr. Albert Hermann who heads the research department of the Western Pine Manufacturers Association, Portland, Oregon. He explained that his association had not been able to get the required service in all respects from research organizations already existing, hence had organized a research department of its own. He believes one of the big steps ahead in forestry is in the field of forest research.

Mr. Olson Addresses Foresters

At their meeting the evening of April 20th, the Associated Foresters had, as their speaker, Mr. D. S. Olson, in charge of planting, District 1. His subject was, "Seed Collecting", and he told in a most interesting way of the part squirrels play in this operation, since one of the easiest ways to gather the cones is to rob squirrel caches. Mr. Olson was here at the invitation of the School, primarily to advise with reference to the development of the new forest nursery.

Geo. M. Cornwall, a Notable Visitor

In the early part of the first semester, Geo. M. Cornwall, Editor of the *Timberman*, paid the School a most welcome visit. He addressed the students of forestry in the afternoon and the Xi Sigma Pi, at a dinner given in his honor, in the evening. Mr. Cornwall was leaving in a few days for an extended trip to foreign countries, including Australia.

A card was recently received from him dated May 25, Honolulu, in which he stated he was then on his homeward voyage. The School is always glad to welcome Mr. Cornwall.

School Again Makes Good Record in Civil Service Examination

The school was again proud of its record this spring in the civil service examination when it learned that five out of seven had passed the examination for the position of junior forester, and four out of five passed the examination for the position of junior range examiner.

TREES ON THE IDAHO CAMPUS

By C. L. PRICE*
Forestry Nurseryman

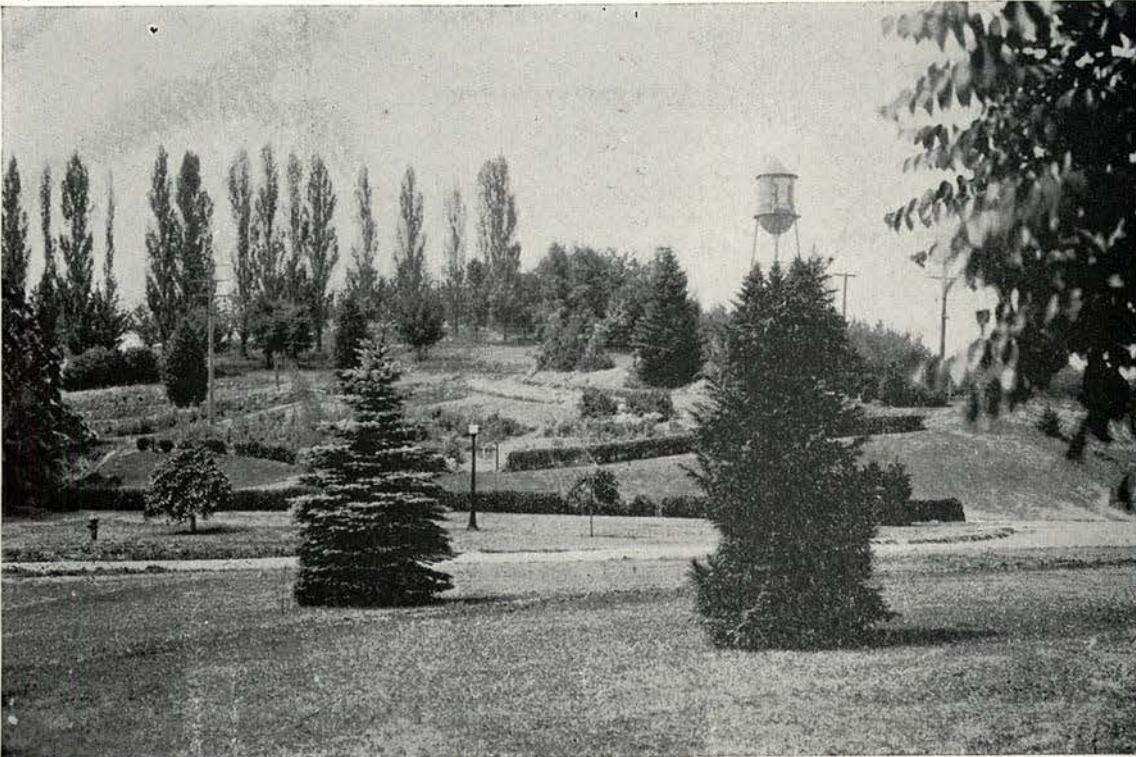
The trees on the campus of the University of Idaho, Moscow, have become so much a part of our lives that those of us who pass by them daily scarcely realize their existence yet were they suddenly to be removed we would immediately clamor for their replacement. They add very materially to the beauty of our campus and assist greatly in forming a most suitable environment for the education of the young men and women of the state.

Of the 136 species of trees growing on the University of Idaho campus many are not indigenous to this part of the United States and not a few are native only to Europe or the Far East. All foreign species, however, are making good growth with few exceptions and these make good progress during years of

suitable growing conditions. It can hardly be expected that a tree native to a tropical climate could equal the growth of one whose range is confined only to our own temperate conditions. However, there is little discrimination in the care of the many varieties so that the Ginkgo tree from China is growing beside the redwood from California and the eastern white pines from the state of Maine are sharing the ground with the Russian poplars or the Austrian pines from Europe, making our campus tree growth very cosmopolitan.

The slope, south and a little west of MacLean Athletic Field, covered with tree growth is known as the forest nursery and it is here that the vast majority of the campus trees are planted and grown. The School of Forestry of the University is responsible for the forest nursery and distributes to all parts of the state over a couple hundred thousand trees annually.

* Editor's Note: Mr. Price came to the University of Idaho in 1909 as Forest Nurseryman at a time when there was but very little tree growth on the campus. Practically all of the trees now growing about the university grounds have been planted by him or under his supervision.



Presidential Trees—(See last paragraph of this article)

Historic Trees on the Campus

To perpetuate the memory of three distinguished guests of the University of Idaho who have visited the campus from time to time three trees have been planted during their visits. One tree is designated as the "Roosevelt Tree", another the "Taft Tree" and a third the "Marshall Tree", each forming the point of a triangle and about 30 feet apart. These trees are all healthy growing specimens as shown by the accompanying photograph. They are standing about 150 feet east and 100 feet south of the main entrance of the Administration Building.

The first of these trees to be planted was

R. Marshall. Since Indiana was his home the red oak, a tree native to that state, was chosen. It has made excellent growth since it was planted—then a small seedling—and it now reaches a height of fifteen feet. The shovels used by these three distinguished guests of the university in planting their respective trees are on display in the museum shelf in the main library of the Administration Building.

Memorial Grove for World War Heroes

In honor of University of Idaho students who lost their lives in the World War, a Memorial Grove, consisting of one tree in memory of each man, was established on the campus.



A View of the Nursery and Arboretum

the "Roosevelt Tree" in honor of Theodore Roosevelt, former president of the United States. This tree is a Colorado blue spruce and was planted April 10, 1911. It is undoubtedly the best specimen of this tree to be found on the campus and now reaches a height of about fifteen feet. It was five years old when our former president threw the first shovel of earth about its roots.

The second of this group of trees to be planted was the "Taft Tree", a Port Orford cedar. It commemorates the visit October 4, 1911 of William Howard Taft, then chief executive of the United States. The tree was five years old then and only about three feet high. Now it is fully fifteen feet high. Just why the Colorado blue spruce and the Port Orford cedar were chosen to be planted by Roosevelt and Taft respectively is not definitely known.

The third corner of the tree triangle is called the "Marshall Tree" and was planted November 17, 1917 by Vice-President Thomas

The planting was made in the spring of 1919 and on the slope just south of the Administration Building, about 150 feet away. Thirty-two former Idaho students made the supreme sacrifice and that number of trees was planted to perpetuate the memory of these heroes. These trees consist of 22 evergreens and ten hardwood trees. The evergreens are Norway spruce, Englemann spruce and Colorado blue spruce and the hardwoods are all red oak. About one year after the planting or on May 30, 1920, Decoration Day, dedication services were held. A bronze plaque bearing the name of each man is hanging in the north end of the hall of the first floor of the Administration Building.

Trees are often planted for protection from the wind and a good example of this on our own campus is the evergreen windbreak south of the Gymnasium, between that building and the tennis courts. The species of trees making up this planting include the Austrian, Scotch and jack pines for the most part but

intermingled with these are some Norway spruce and Douglas fir trees. The benefit of this windbreak is distinctly felt in walking between the Gymnasium and the Administration Building on days of a severe westerly wind. This windbreak was established in 1916 and in the ten years of its existence some of the trees, especially the Scotch pines, have attained a height of 20 feet.

In no other way can the beauty, usefulness and attractiveness of our campus be improved and secured so cheaply, easily and satisfactorily as by the planting of trees. Joyce Kilmer in his poem "Trees" paid a fine tribute to this form of plant life when he wrote:

I think that I shall never see
A poem lovely as a tree.
A tree whose hungry mouth is prest
Against the Earth's sweet flowing breast.
A tree that looks at God all day
And lifts her leafy arms to pray.
A tree that may in summer wear
A nest of robins in her hair.
Upon whose bosom snow has lain;
Who ultimately lives with rain.
Poems are made by fools like me,
But only God can make a tree.

Presidential Trees

The Port Orford Cedar planted by Taft is shown in the right foreground and the Colorado Blue Spruce to the left is the Roosevelt Tree. The third corner of the tree triangle or the Red Oak planted by Marshall is just beyond the left edge of the photograph. The Memorial Grove is about on a line between the Taft Tree and the "I" water tank, a little to the right of center and on the slope just above the university flower garden which is also shown in the photograph.

PRIVATE FORESTRY IN IDAHO

(Continued from Page 8)

was fair, the price received has put the balance sheet in the red.

The present cause of distress is generally conceded to be a matter of over-production. There has been in recent years a marked over-development in both milling and logging facilities, with the result that, if operated economically at near capacity, there is a surplus of stock. Also we have concerns which, on account of financial distress, are forced to liquidate to meet floating debts, bond interest and short maturing paper and to effect economies in taxes and carrying charges. Under conditions where there is little or no profit in the conversion of virgin timber, there is

little incentive for changes in cutting and logging methods which would place additional expense on the operation. This added expense must be defrayed out of current profits.

The present application of the general property tax to forests and forest lands is conceded by tax economists to be unequitable and unsound. The position of the timber grower is unique in that it is the only enterprise forced to pay annual taxes many years in advance of any income from lands so taxed. The ever increasing tax burden, in meeting the public demand for better schools, highways and public improvements, has had a profound influence in hastening the cutting of mature timber and discouraging the holding of lands for reforestation. Under existing conditions little relief is in sight.

There is also the attitude of taxing boards and the public generally toward corporate ownership. The weird and fantastic boundaries of school and highway districts in timbered regions evidence the determined effort to force taxes on this class of ownership without regard to benefits accruing to those who pay the bill. Within the counties there is a constant tendency to keep shifting the tax burden to corporate ownership for political expediency. Many of these political subdivisions in Idaho have now reached a point where long term bonds have been issued to the statutory limit. In many cases the virgin timber will be cut before maturity of the bonds with the result that the owners of the logged-off land will be forced to retire the indebtedness.

In addition to these handicaps confronting forestry enterprises there are the uncertainties of future timber values, future legislative trends and the ever present risks of fires, insects and disease. Likewise, we have the bugaboo of the compound interest table with its terrifying results when extended over long rotation periods at current rates of interest.

The real crux of the forestry problem in Idaho at the present time is "Slash Disposal." Lumbermen and foresters are practically unanimous in this conclusion. It is necessary that slash incident to logging be disposed of for the purpose of reducing fire hazard, but it is not essential wholly from a silvicultural standpoint.

Idaho Forestry Law

The Idaho Forestry Law of 1925 is based upon the requirements of compulsory slash disposal and fire protection. It provides that slash created in logging "shall be piled and

burned", unless other methods of disposal are authorized by the State Forester. The system of broadcast burning is very objectionable; but, the piling and burning requirement in the denser stands is costly in its application and in some cases greatly out of proportion to the values involved. At the same time the results obtained are often discouraging. Fire, when used under the most favorable conditions, is treacherous.

Naturally the law has had some opposition, but, however, it was a progressive step and has brought beneficial results in emphasizing upon the private owner his responsibility with reference to slash hazard and forest protection. Coincident with this, it has stimulated thought and action in the industry and actively set it to work upon the problem.

We have focused sufficiently upon the deterrent factors confronting the issue and it is reasonable to assume that, by reason of the impetus back of the movement, these adverse conditions will be met frankly and open-mindedly by private and public interests. Practical solutions will be worked out as in the past.

Swing Toward Silviculture

The swing to meet silvicultural demands will, however, be slow and carried only to the point where logging costs can be increased

and still meet competition. These developments in Idaho will naturally follow like developments in competing regions where economic conditions are more favorable.

The fact must not be overlooked that the successful operation of any reforestation policy will largely depend upon the logger for its execution. The policy adopted will necessarily have to be a compromise with his problems. It is not enough to send him red penciled copies of forestry laws and regulations. He must have an appreciative knowledge of the objective to be attained and be in accord with the program.

There is reason to believe that the future of forestry by private enterprise in Idaho is hopeful. The present interest shown in the subject and the results obtained by crude forestry practises in the past would warrant this assertion. It is significant that managers, woods superintendents and men in the woods are discussing the proposition and consultation with foresters and forest economists is being sought.

With favorable economic developments and a fuller realization and more common understanding that the interest of the public is concurrent with the interest of the private owner in any reforestation program, striking and encouraging trends will take definite form.

IDAHO FOREST SCHOOL EXPANDS ITS NURSERY

The lease of a twenty-seven acre tract gives the School of Forestry about forty acres for its forest nursery and arboretum. The most of this area will eventually be used for forest nursery purposes, and when fully developed the School will have one of the largest state controlled forest nurseries in the west.

The newly acquired leasehold adjoins the city limits of Moscow on the south and the university campus on the east. The east end abuts the North and South Highway. In point of situation, soil and topography the tract is splendidly adapted to forest nursery purposes. Being adjacent to the campus, it will be an inexpensive matter to supply this tract with water from the university system. The water system is now being installed.

The tract will be used primarily to grow planting stock for the establishment of farm woodlots, shelterbelts and windbreaks under a cooperative agreement between the School of Forestry and the U. S. Forest Service according to the terms of the federal law known as

the Clarke-McNary Act. This agreement will make it possible for the School to supply the farmers of the state with planting material at very nominal prices.

Since all the tract will not be needed at once to grow nursery stock a part of it will be used meanwhile to demonstrate methods of establishing and growing type woodlots and windbreaks. Eight or ten acres will be used for these purposes.

The securing of this fine piece of ground will make it possible for the School to meet the demands for forest planting stock quite indefinitely as the nursery may now be gradually enlarged till it will eventually have an annual capacity of a good many millions of trees.

It is especially desired to encourage windbreak, shelterbelt and woodlot planting. The growing of shade trees will also be put on a much larger scale in order to give the public better service in ornamental planting.

THE ASSOCIATED FORESTERS

By F. W. GODDEN, '27

The modern trend in all lines of activity is organization of one kind or another, and in keeping with such a trend the students of forestry in the University have organized a club called the Associated Foresters, composed of students of forestry and Forest School faculty members.

The primary objectives in organizing this club was to make possible closer fellowship among the forestry students by conducting a definite social program during each school year, by holding club meetings periodically, and by affording the foresters a means of ex-

for the students to gather and study or visit.

The social program sponsored by the club in the past has been four major events, a dance, a smoker, a banquet, and a barbecue.

The first of these events held during the past year was an all college dance given at the Blue Bucket Inn on Hallowe'en Eve. This was a very attractive dance with decorations of cedar boughs and Hallowe'en suggestions. The only regrettable feature about the Foresters' Ball was the limited capacity of the hall since more people wished to attend than could be accommodated.



Associated Foresters, 1926-27

pressing themselves regarding plans of the school.

The club meetings are gatherings which all of the students attend and at which topics of interest to foresters are discussed. Quite frequently speakers from the Forest Service and other branches of the profession are obtained to talk to the group. The gatherings are usually terminated with a "feed" in the Club Room.

The Club also provides a number of pictures, maps, game mounts, and magazines in the Club Room to make it an enjoyable place

The second event on the social calendar was the Smoker, held in the gymnasium during the winter. A variety of boxing, wrestling, and tumbling events, chalk-artistry, music, and special features filled the early part of the program while the remaining portion was a big feed and the "smokes".

The third and most elaborate event, the Banquet, was held March 17 at the Blue Bucket Inn. This was a very enjoyable affair attended by all of the students of forestry, Forest School faculty members, and a number of guests from the Forest Service,

Inland Empire lumbermen, Moscow citizens, and the University faculty. A wonderful dinner was served, after which, Toastmaster Hubert and the speakers for the occasion gave a very enjoyable program of humorous and serious talks.

Last but not least on the Club's program of functions to secure unity and fellowship among the students is to provide a means of expression for the foresters on the campus through the University paper and other publications. This is secured in part through a publicity man who serves as a reporter and

writes up all activities of the foresters and turns them in to the editors. Space is also obtained in the Gem of the Mountains, the university annual, where the forester's group picture appears with a roll of all foresters attending the University.

Further publicity is obtained through this magazine, which as all the readers know, is published by the Associated Foresters.

Considered in all of its aspects the Forest Club is a big factor in the student life of the foresters at Idaho since it provides recreation and a means of unifying the student body.

WHAT THE BOYS WILL BE DOING THIS SUMMER

Milton Anderson and Russell LeBarron are to be stationed at the Honeysuckle Ranger Station near Coeur d'Alene, Idaho.

Fred S. Auger and Charley Langer will be working for the Clearwater Timber Company at Pierce, Idaho.

Donald H. Axtell, Selway National Forest, Koosk'a, Idaho.

John C. Baird is going to the R. O. T. C. Summer Camps at Fort George Wright and will afterwards accept a junior range examiner appointment in Wyoming. Address S.A.E. Moscow, Idaho.

Prentice Balch, Henry Hoffman, Percy Rowe, Jack Hume, Gordon Flack and "Al" Cochran will be in charge of reconnaissance crews for the Office of Blister Rust Control 618 Realty Bldg., Spokane, Wash.

Cary H. Bennett, address c/o School of Forestry, Moscow. He will be on investigative work for the School of Forestry.

John B. Biker, has accepted employment with the West Kootenay Power and Light Co., Nelson, B. C.

Buford C. Boyd, will be stationed at the Dixie Ranger Station, Nezperce Forest, Grangeville, Idaho. The work will consist mostly of trail construction.

T. Stewart Buchanan, Morton, Washington.

Arthur Buckingham is an assistant ranger on the Clearwater National Forest. Address, Orofino, Idaho.

Leslie Burton, will build trail at the Red River Ranger Station, Elk City, Idaho.

Howard C. Cherry, 87 North St., Blackfoot, Idaho.

William Coleman, Cascade, Idaho.

Charles A. Connaughton is on timber survey work on the Boise National Forest, Boise, Idaho.

Geo. A. Criser will be a patrolman on the Challis Forest, Challis, Idaho.

Lyman D. Crosthwait is getting up in the world this summer on a lookout at Foam Creek Ranger Station, Challis, Idaho.

John A. Croy, Clarkston, Wn.

Robert Davis is on timber survey work with the School of Forestry in the Clearwater region.

Gordon Ellis will be engaged this summer on grazing reconnaissance on the Jefferson Forest, Martendale, Montana.

Herman Ficke, Payette, Idaho.

George M. Fisher is on blister rust work. Address 618 Realty Building, Spokane Washington.

Norman B. Forester may find a forester's life has its difficulties, as chasing smoke on the Clearwater offers a variety of experiences.

Leo M. Frost will make forage and timber appraisals for the Forest Service at Coram, Montana.

George A. Garmo will be on the Selway National Forest, stationed at Howell, Idaho.

C. W. Goodwin will spend the summer at his home, 116 Monticello Ave., Piedmont, Calif.

Chas. A. Gregory, R.O.T.C. Summer Camp Fort George Wright, 5712 N. Virginia Ave., Spokane, Washington.

Andrew G. Halverson, Kimberly, Idaho.

Alden B. Hatch will be with the Northern Rocky Mountain Forest Experiment Station. His address is Priest River, Idaho.

Tracy L. Heggie has accepted an appointment as junior range examiner at Albuquerque, New Mexico.

Geo. V. Hjort, Moscow, Idaho.

James Hockaday, will be on construction work on the Sawtooth National Forest, Hailey, Idaho.

Primo E. Icarangal is ill in a hospital at Portland, Oregon.

George J. Illichevsky is with the Office of Blister Rust Control, 618 Realty Building, Spokane, Washington.

George M. Jemison will be on trail crew work at Magee Ranger Station, Coeur d'Alene, Idaho.

Dean C. Kaylor is going up to the land of the Eskimo this summer. He may be reached at Petersburg, Alaska.

Fred H. Kennedy has accepted work on a timber survey on the Boise National Forest, Boise, Idaho.

William T. Krummes is in the employ of the School of Forestry in the Clearwater country.

Clive J. Lindsay, Hazelton, Idaho.

W. Faber Mershon is working with the R. C. Baruum Co., Wallowa, Oregon this summer.

Francis W. Minch and Howard J. Sargeant will be on a trail crew at Musselshell Ranger Station, Orofino, Idaho.

William Mitchell will be on timber survey with the School of Forestry in the Clear-

water country. His address is Moscow, Idaho.

Arthur M. Norby, Rupert, Idaho.

Carl A. Remington, landscape gardening, Worcester, Mass.

Martin B. Rosell, Potlatch Lumber Co., Elk River, Idaho.

Wallace M. Saling, will also be riding "kyuses" this summer. He will be engaged on grazing reconnaissance on the Uinta National Forest, Springville, Utah.

Carl Shaw will be a lookout with W. H. Bolles on the Idaho National Forest, McCall, Idaho.

William S. Sheldon expects to spend the summer in travel.

Liter E. Spence. We feel for the horse "Liter" rides this summer on grazing reconnaissance, Martindale, Montana.

Earl E. Stahl, Rigby, Idaho.

Wilfred B. Stanley, Nezperce National Forest, Grangeville, Idaho.

Clarence E. Stowasser will try his hand at mill work. 525 W. Summit Ave., Coeur d'Alene, Idaho.

Cyprian D. N. Taylor will be engaged on survey work at Nelson, B. C.

Rex Wendle, fire patrolman, Northern Pacific Railroad Co., Sandpoint, Idaho.

Harry L. Whiting, will again be in blister rust reconnaissance. His address is 618 Realty Building, Spokane, Washington.

Marvin B. Wild, Ranger c/o A. E. Pauleys, Ione, Washington.

FORESTERS HOLD ANNUAL BANQUET

By A. B. HATCH, '28

The eleventh annual banquet of the Associated Foresters of the University of Idaho, held at the Blue Bucket Inn, March 17, proved to be the most successful and enjoyable in recent years. The speeches were unusually good, being spicy, short and full of interest. Dr. E. E. Hubert, who acted as toastmaster, introduced each speaker with appropriate remarks.

Dr. Upham was the first speaker of the evening and gave his "impressions" of the forest school and its students. He referred to the Associated Forester as being the most cosmopolitan group on the campus and expressed his opinion that the contact with

these students from other states and countries, broadened the perspective of the Idaho students. The administrative policy is to heartily welcome these students from other states. In forestry, probably more than in any other profession, it is important that the student become acquainted with the problems incident to the work in all parts of the country. Hence, the great advantage of being able to associate himself with students from many different states. "I never fail", Dr. Upham remarked, "as I travel about the state to speak a good word for the School of Forestry."

Professor C. W. Chenoweth gave much good and humorous advice to prospective smoke chasers. His advice is based on many hair

raising, personal experiences in the Forest Service. He recommended that one take plenty of fishing tackle in going out for a summer of smoke chasing. He emphasized however, that a dress suit is not necessary to one's equipment. Fishing tackle seems to be the only equipment one needs for this kind of work. Other observations from personal experiences which Professor Chenoweth made ranged from mules to the electron theory.

The president of the Associated Foresters, Floyd Godden, was next introduced as a famous speaker. He gave an account of the principal activities of the Associated Foresters. It seems that the foresters originated the traditional wearing of camouflage on the upper lip. A logical explanation for this change in custom lies in the wild and unshaven life led by the timber beasts during the summer. Other traditions of the Associated Foresters are the annual all-college dance, the smoker, the farewell banquet for the seniors and the famous spring barbecue.

Mr. Harry Whittier, cashier of the Moscow State Bank, gave a talk on business ethics as related to forestry. Mr. Whittier told of the evolution of ethics in the last two centuries and showed that the ethical standards of today are far better than they were in the past. He established the fact that business ethics of today become laws of tomorrow. Two centuries ago churches were established by lottery, today lottery is not only unethical but unlawful. The successful business of today is based on sound ethics which in the great majority of instances is to the interest of the public. Today's ethical slogan is "the greatest good to the greatest number."

Rev. Roger P. Oliver gave a very inspiring address regarding America's need for foresters to restock the great areas of barren lands and to prevent the further devastation of the forests. Rev. Oliver emphasized the wonderful and unexcelled opportunity for service presented to the young man entering forestry. He cited as an example of one of his statements the remarkable straightness and tallness of certain trees subjected to wind, storm and many other adverse conditions. His message to all, which we will not soon forget was "when the outlook is bad, try the uplook."

H. T. Gisbourne, associate silviculturist Northern Rocky Mountain Forest Experiment Station, Missoula, Montana, forcibly reminded the foresters of the time and effort the forestry professors of Idaho are giving to educate the students. Idaho has become famous the

country over for the excellence, finish and capability of its graduates. It stands second to no other forest school in the country and is held in high esteem by the Forest Service. Mr. Gisbourne further asserted that the type of finished technical foresters produced by this school, is due entirely to the faculty and the energy and conscientiousness with which they pursue their work.

Mr. A. D. Decker, connected with the Potlatch Lumber Company, was the next speaker. He very ably presented the lumbermen's side of the devastation problem. We heartily agree with Mr. Decker that the lumberman does not leave the forest devastated from his own choice. Economic conditions have been, and to a great extent, still are dictating the policy of the lumbermen. The lumbermen will continue to "cut clean and pull out" just as long as it is impossible from an economic standpoint to practice forestry. Lumbering is a business just as much as banking. The banker cannot carry on his business without a profit and neither can the lumberman. The foresters of the country however understand the conditions and are endeavoring in every way to aid the lumbermen in their problems.

Mr. S. V. Fullaway, Jr., assistant district forester in charge of forest products, Missoula, Montana, was the last speaker of the evening. The setbacks encountered by the student entering forestry were first recounted by Mr. Fullaway, who cited his own experience from the time he first entered forestry. Like many men new to the game and unaccustomed to the woods Mr. Fullaway went back to school after his first summer with the Forest Service in Colorado feeling that he never wanted to see the woods again. By the following spring however he had quite forgotten his misgivings of the previous fall and went back to the woods. That was nearly twenty years ago and Mr. Fullaway is still in the Forest Service.

Toastmaster Hubert finished the evening by introducing several distinguished guests and the Idaho graduates present. The guests were: Mr. Ludwig Swanson, in charge of the dry kiln operations of the Potlatch Lumber Co.; Mr. A. A. Segersten and Mr. H. S. Tussler, connected with the land office of the same company. The Idaho graduates were E. W. Renshaw and Adrian Nelson who are connected with the State forestry office in Moscow, and Harold Z. White of the Clearwater Timber, Company, Lewiston, and Mr. Howard W. Staples.

XI SIGMA PI

WILFRED F. BEALS

Xi Sigma Pi National Honorary Fraternity was organized as a local society at the University of Washington in 1908. The objects of the fraternity are to secure and maintain a high standard of scholarship in forest education, to work for the upbuilding of the profession of forestry and to promote fraternal relations among earnest workers engaged in forest activities.

A new constitution with a wider field was drawn up in 1915 and the fraternity became a national organization. Since 1915 eight other chapters have been installed at prominent forest schools throughout the United States. Epsilon Chapter of Xi Sigma Pi was established at the University of Idaho in 1920 with a membership of seven, two members of the faculty and five students. Each year has seen an increase in the membership of the fraternity and an increase in the activities. At present there are five faculty members and fourteen student members.

To be eligible for membership in Xi Sigma Pi, a student must have completed two and one-half years of standard college work in an approved school of forestry. Three-fourths of his grades shall have been above 80%, and he shall have received no failures in forestry subjects. He shall also have shown creditable interest and activity in practical forestry work. Scholastic standing in forestry is not the only aim of the fraternity, as it wants to stimulate and increase the activities and interest of the undergraduates in all matters dealing with forestry.

Soon after its establishment the Idaho chapter of Xi Sigma Pi inaugurated a movement to stimulate scholarship in forestry education. As a result, the chapter purchased an attractively designed bronze tablet, upon which are engraved each year the names of the stu-

dents attaining the highest average in each class for the year. This tablet is placed on the walls of the main floor of the Administration Building, and the honor of having one's name upon it acts as a beacon throughout the four years.

Those students who have so far reached the goal are as follows:

1922—James W. Farrell, senior; Russell M. Parsons, junior; Arthur M. Sowder, sophomore; Paul M. Harlan, freshman.

1923—Albert S. Daniels, senior; Ralph S. Space, junior; Paul M. Harlan, sophomore; Floyd W. Godden, freshman.

1924—Fogers G. Wheaton, senior; Robert P. McLaughlin, junior; Floyd W. Godden, sophomore; Henry C. Hoffman, freshman.

1925—Ralph S. Space, senior; Warren H. Bolles, junior; Galen W. Pike, sophomore; William W. Mitchell, freshman.

1926—Warren H. Bolles, senior; Galen W. Pike, junior; Charles A. Connaughton, sophomore; George J. Illichevsky, freshman.

When prominent foresters visit the campus it has been the custom of the fraternity to have a luncheon followed by informal talks. This has not only served to get the men together in a social way, but they have always been given a message full of helpful pointers on matters of forestry.

The officers of Epsilon Chapter for the year just closing are:

Galen W. Pike, Forester, Mark M. Lehrbas, Associate Forester, Henry C. Hoffman, Secretary-Fiscal Agent, and Eugene V. Phelps, Ranger.

On April 12 the following new members were initiated: Arlie W. Toole, '27, Wm. W. Mitchell, '28, Chas. A. Connaughton, '28, Allan A. Cochran, '28, Liler F. Spence, '28.

SEEDING AND PLANTING TRIP

JACK SPACE

Each year the class in Seeding and Planting makes a trip into the northern part of the state, in order to acquire practical experience in planting. On this trip the boys get a chance to see some beautiful country that they probably couldn't get to see other-

wise. Last year the trip was made to the Priest River Experiment Station near Priest River, Idaho. This year the class went to a government camp on the north side of Priest Lake about ten miles from Coolin.

The class left Moscow Wednesday, May 4,

some by auto and others by train. At Priest River the class was met by a government forest truck which took them to Coolin that night. Here they stayed over night. The following morning a small steam driven boat took the class up the lake to camp. The camp consisted of about 8 tents, one being an office, another the cook tent and the rest were sleeping tents.

Beginning Thursday noon the class planted trees for five days. The trees that were plant-

ed were western yellow pine, western white pine, and Englemann spruce. The latter two were planted only on the very best site. The stock was shipped in from the Savanac Nursery at Haugen, Montana. The yellow pine and white pine consisted of two year old transplants, and Engelman spruce five year old seedlings.

The class returned May 10, everyone feeling well repaid for the outlay of time in making the trip.

THE BETTER UTILIZATION OF WESTERN WHITE PINE MATCH STOCK

(Continued from Page 20)

hydrochloric acid, which burned the wood.

A similar experiment was run on the blue stain culture with no effect, because the threads were submerged in the agar culture medium. Hydrogen bisulphide gas was tried in the same manner, but it bleached the wood and not the threads of blue stain. With the apparatus used, there was no attempt to determine the volume of gas used.

No other bleachers were used as it would not be practical to have to wet the match stems while in the process of manufacture.

The conclusion that may be drawn from this experiment is that with a proper length of time and a proper concentration of dry chlorine gas, blue stained splints can be bleached on a commercial basis, as chlorine is a relatively cheap chemical and can be purchased in almost unlimited quantities. Practical tests are necessary, however, before any reliable conclusions can be drawn relative to the economic feasibility.

In the match industry the loss due to blue stain has not been accurately determined. Perhaps the reason for this is that cross grained heart pieces and knots all go into the waste bin with the blued pieces. But in order to determine whether it would pay to save the blued pieces, the amount wasted would first have to be determined.

The total waste in all branches of industry, due to blue stain, is estimated at ten million dollars. (6) So that if the match industry, which bears its proportion of the waste, could put all or a part of this on the profit side, it would make quite a difference in their balance sheet.

Conclusion

In conclusion, it might be said that there is

room for more utilization of blued material. Some companies are working in blued stock, but others object to its appearance. The results tend to show that as the price of white pine increases, the match companies will use blued stock as it appears or will bleach it. Bleaching blue stained wood is possible, as the experiment has shown. But if the blued stock can be worked in unbleached a greater saving will be made. Their demand of research is to find something to take the place of the expensive White Pine. A separate blue grade cannot be created at this time, and more utilization cannot be had by shortening the length of the splint. The fact that some match companies are working in blued stock now indicates that perhaps the most logical result will be the working in of the blued material unbleached by all manufacturers in the near future.

BIBLIOGRAPHY

- (1) "Preservation of Structural Timbers." Howard F. Weiss, p. 222.
- (2) "Mechanical Properties of Wood." Samuel J. Record, p. 68.
- (3) "The Staining and Molding of Lumber and Other Wood Products." E. E. Hubert. U. S. Department of Agriculture, Forest Service Forest Products Laboratory in cooperation with University of Wisconsin, Madison, Wisconsin. Approved Copy Filed 9-1-22.
- (4) "Utilization of Blue-stained Lumber." Technical Note Number 184. Forest Products Laboratory, Madison, Wisconsin.
- (5) "Cause and Prevention of Blue Stain." Technical Note Number 151. Forest Products Laboratory, Madison, Wisconsin.
- (6) "The Sap Stain Problem and a Ten Million Dollar Loss." E. E. Hubert.
- (7) "Effect of Kiln Drying, Steaming, and Air Seasoning on Certain Fungi in Wood." E. E. Hubert. United States Department of Agriculture Bulletin No. 1262.

NEW EXTENSION FORESTER AND HIS JOB

By F. G. MILLER

One of the more recent developments for the advancement of forestry in the United States is the inauguration of extension forestry in various states, headed by extension foresters who function in the promotion of forestry in much the same way that agricultural extension specialists function in the promotion of agriculture.

The first efforts at organizing forest extension by the states were made by Michigan in 1911, followed by New York in 1912. Little progress was made by other states till after the close of the World War, but since then the idea has been taken up by the states one after the other in rather rapid succession till at the present time the majority of them have inaugurated definite forest extension policies, and more than thirty have appointed extension foresters.

The movement was given added impetus by the enactment of the Clarke-McNary Law in 1924. Section 5 of this act authorizes the United States secretary of agriculture to extend federal aid to the states in assisting "owners of farms in establishing, improving, and renewing woodlots, shelterbelts, windbreaks and other valuable forest growth, and in growing and renewing useful timber crops," provided that the amount expended by the federal government for this purpose shall not exceed the amount expended by any given state for the same purpose during any fiscal year.

Thru the cooperation of the United States department of agriculture and the extension division of the University of Idaho, under the terms of this act the office of extension forester to Idaho was recently created, and on April 16 Arthur M. Sowder was appointed to the position. Tho serving in the extension division the school of forestry will cooperate in outlining and directing his projects.

Mr. Sowder was graduated from the school of forestry, University of Idaho, in 1925, with the degree of Bachelor of Science in Forestry, and received the degree of Master of Science in Forestry in June of this year. While a student, he served for three years as secretary to the school of forestry, and in handling tree sales in that capacity, became well acquainted with the problem of tree planting in the state. He also has a practical knowledge of the native woodlot sections, hence by both training and experience is well qualified for

this newly created post. For the remainder of this biennium he will act in the dual capacity of extension forester and research assistant in farm forestry under a cooperative arrangement between the agricultural experiment station and the school of forestry.

In this appointment Mr. Sowder becomes a part of the agricultural extension force of the University and will have the active cooperation of the various members of this strong organization in his work.

The field of work for an extension forester in Idaho is a large and an exceedingly im-



Arthur M. Sowder
Extension Forester

portant one and one that offers a rare opportunity for public service. The growing of timber is too often thought to be solely an obligation of the federal government and the state, but the Clarke-McNary Law recognizes the great need of private forestry, including its application to the farm, and this law seeks to encourage the farmer to include timber growing as a part of the program for diversified agriculture by placing at his command the services of an expert adviser.

Farm forest planting, so extensively practiced in other states, especially in those of the middle west, has not received the attention in Idaho that its importance deserves. A woodlot shelterbelt or windbreak on every

farm in Idaho should be the aim. At present, however, the larger portion of the farms in the treeless belts, bear little or no tree growth at all. That trees will succeed almost everywhere is attested by the fact that in practically all sections successful plantings are found. It is profitable to grow on the farm the fuelwood, posts, poles, and repair material required for home use. Besides such planting if properly placed will add comfort to the home, will prove ornamental, and will enhance the value of the farm property. Windbreaks should be very generally established. By checking soil erosion, reducing the evaporation of soil moisture, and breaking the mechanical force of windstorms they tend to increase crop production in many sections.

It will be the duty of the extension forester to advise the farmer in the choice of species to use, in methods of establishing various kinds of forest plantings, to impart information as to the care and management of farm woodlands, and to aid in the harvesting and selling of the forest products from them.

A small unknown acreage of farm forest plantings has been established in Idaho. These are found mainly in the irrigated belts. Records accurately made show many of them to be very valuable and give assurance that much more such planting would be profitable. Advantage will be taken of some of the more successful of existing woodlots and windbreaks in demonstrating their practicability as a part of the farming enterprise. Other demonstration woodlots, shelterbelts, and windbreaks will be established in various localities as object lessons to prospective planters.

One of the biggest jobs of the extension forester will be to bring about better management for the more than 800,000 acres of native woodlots, which the federal census credits to Idaho. These are found in the wooded belts of the state and consist of uncleared portions of the farms which are being developed from logged-off lands. While a certain per cent of these woodlots is agricultural in character and will eventually be cleared for tillage, yet a large portion of them occupies land too steep, too rocky, or otherwise off-color for farming and should be left permanently in forest.

As showing the value of these woodlot areas, it may be cited that the census schedules for 1920 called for the value in detail of woodlot products sold from or used on the farms in 1919. The items included firewood, fencing

materials, logs, railroad ties, telegraph and telephone poles, materials for barrels, bark, or other forest products.

In Idaho, a total of 5,041 farms, or 12 per cent of the total number of farms in the state at that time, reported forest products sold from or used on the farms in Idaho in 1919, as having a value of \$2,329,244, an average of \$462 per farm. This is income which is largely net to the farmer, since the labor involved in harvesting and marketing is performed mostly in winter when he has the most spare time. It is income too, which with proper management may be greatly increased. In fact the increase in the decade from 1909 to 1919 was nearly 90 per cent. Just now a market is developing in the northern part of the state, for material suitable for paper pulp.

Thus it is that with upwards of 800,000 acres of forest land in the hands of the farmers, no small part of the responsibility for the proper handling of the forest resources falls directly upon them, a responsibility which they are accepting in increasing numbers since farm forestry is becoming more and more remunerative. Farm forestry is in short essential to the success of the forest policy of the state.

Fortunately there is an occasional example of a well managed native woodlot which the extension forester may use to demonstrate methods of bringing about better practices to make the native farm woods generally more profitable. He will also have the cooperation of the owners in placing other typical native woodlots under proper management to serve as demonstration woodland areas.

Windbreak Study

As research assistant in the agricultural experiment station, Mr. Sowder will undertake a study to determine the influence of windbreaks on the growth and yields of field and orchard crops grown under irrigation. The study will also stress the importance of establishing shelterbelts around the farm buildings for the protection of the family home and stock yards. In carrying out the project an extensive series of measurements will be made of the physical factors of crop production as influenced by the presence of windbreaks.

The investigation will also determine the species of trees best adapted to windbreak purposes, the arrangement of the trees to secure their best use, and the value of the products to be derived from the windbreak in order to determine the income from the land it occupies.

THE 1927 SPRING CRUISE

By H. I. NETTLETON

The annual spring cruise was held, May 6-11, on Flannigan Creek, seventeen miles northeast of Moscow. Ten men travelled by truck to the old camp site where the first half day was spent in establishing a comfortable camp for the week's work. The first event, upon arriving, was the selecting by lottery of the cook and his assistant. To Connaughton and Biker fell the strenuous task of building a camp stove and preparing the first meals, these duties being accompanied by considerable chaffing from their luckier teammates. An inspection trip to the lower Flannigan Creek area was made in the afternoon to study several species of wood rots and to discuss the best methods of handling them in the cruising work.

On the following day the men were divided into two control parties of four men each, for the purpose of retracing the boundaries of the section to be cruised and mapped. Elevation and strip controls were established by the double abney method, using topographic tape for distance and Forest Service staff compass for alignment. Elevation control tied in within four feet in four miles of line running, thus successfully completing the program for the second day.

On the third and successive days, the crew was divided into two man parties for the cruising and mapping of the area. The same instruments were used as in the control work, except that single abneys were used for strip running. A ten per cent cruise was made, running two strips per forty and using a twenty foot contour interval on a sixteen inch map scale.

In this work one man acted as compassman, head chainman and topographer while the second man acted as rear chain and abney man, taking slope shots and then cruising up to the topographer, after which both men moved forward for another one or two chain lengths, depending on conditions of visibility and topography. Types were mapped by the topographer and cruise sheets were changed at type changes by the cruiser. The cruising and mapping were completed in two and a half days, including time for re-running two of the eight strips. Due to heavy underbrush and dense reproduction, but one mile of line per crew per day was thought advisable.

In order to check the mapping of roads and contours, two two-man parties were dispatched the last day to run a compass, chain and double abney traverse over the logging roads which transected the section. These traverses were then plotted on the field map and served as an excellent check, both against the mapped location of the roads as crossed by the strip crews and the location of the contours as mapped by the topographers. The field map was completed in the field, adding and connecting each day's run of strips as completed.

By leaving one man in camp each day to act as watchman and cook and to work on the base map, the field workers had longer evenings in which to indulge in camp pastimes and swap stories over the evening campfire. Several members of the fair sex, chaperoned by the wife of the chief of party, descended upon the camp one evening and gave a decided variety to the usual evening entertainment, especially when all hands staged an old fashioned Virginia reel in the moonlight, to the tinkling accompaniment of mandolin and the crunching melody of calked boots on "lady-slippers." Light refreshments (marshmallows) were served between impromptu acts, conceived on the spur of the moment by the hosts and executed in fair order for the special benefit of the visitors. Rowe and Lansdon, Incorporated, "brought down the tents" with their Indian war dance. Thus, with daily duties and evening pleasures, the second annual spring trip came to a close and the boys returned to the classroom to compile the cruise data, which, incidentally checked within six and a half percent of the states' cruise, made two years previous.

The following men made the trip: John Baird, Carey Bennett, John Biker, Charles Connaughton, Gordon Ellis, William Lansdon, William Mitchell, Percy Rowe, Wellington Seymour and H. I. Nettleton, chief-of-party.

Associated Foresters Elect

At the last meeting of the year, May 31st, the Associated Foresters elected officers for the ensuing year as follows: Chas. A. Gregory, President; W. M. Saling, Vice-President; A. R. Cochran, Secretary-Treasurer; and M. B. Roselle, Publicity Agent.

PARTIAL CUTTING AND STIMULATED GROWTH IN WESTERN WHITE PINE

(Continued from Page 16)

data were available for the Clearwater region, and these were based on a few trees for only 13 years, whereas our predictions were to be made for 35 years. The only other material available was an excellent piece of work, but carried out in the Potlatch region of north Idaho—a region where growth conditions seem to be somewhat poorer than in the Clearwater country. This Potlatch study was carried on over a period of three years by H. I. Nettleton of the Idaho School of Forestry. A summary of the work is presented in table III. Nettleton's work shows the effect of stimulation for a period of 20 years. The table shows the mean annual growth during this time. It is assumed that the same rate of growth would continue up to the 35 year point. The stimulation in height growth is not shown here. It proved to have the same relation to diameter as the trees grown in a closed stand, so in figuring volumes the same numbers of logs for the different diameters were used as in the calculation of the volume of the original stand.

At the rate of growth shown in the table above even a one inch tree will grow up into the merchantable 7 inch class in 35 years.

incident to logging or from other causes will in 35 years produce 13,859 feet—an increase of about 500%. In the same way the residual white pine increases 700%—from 1382 feet to 10484 feet. The mean annual volume production for all species during the 35 year period is about 335 board feet per acre. For the white pine it is 260 board feet. The total cut in the residual stand will be 39% of the present cut in the original stand, and the future cut of white pine will be 45% of the present production.

Losses in the Residual Stand Due to Logging

Thus far in our calculations we have been dealing with what might be termed a potential residual stand, i. e. it contains all trees 11 inches in diameter and under as they occur in the stand before logging. It is certain that there will be considerable loss in this residual stand from breakage incidental to logging. At the time that these field studies which are the basis of the stand table were being made no logging had been done. Logging began in September, and in October came an opportunity to examine logged areas and see just how much timber was being left. The sawyers had been instructed to leave all trees under 12 inches in diameter, but it was a question as to how closely they were observing this limit, and it was even more important to determine the number of trees broken and

Table IV
Volumes in the Residual Stand 35 Years After Logging
In Board Feet Per Average Acre

B. B. H.	Western White Pine	White Fir	Douglas Fir	Cedar	Larch	Lodgepole Pine	Spruce	Totals
7		120.4				2.6		123.0
8	186.0	97.6	18.6	38.6	1.0	0.6	2.0	344.4
9	329.5	145.8	31.6	28.4	0.7	4.2	3.6	543.8
10	272.0	160.8	39.0	52.0	2.2	4.8	10.4	541.2
11			95.2	48.5	37.8	10.4	18.4	210.3
12	800.8	304.0	64.8	93.6	7.6	16.8	5.2	1,292.8
13		178.4	106.0	164.0	12.3	21.0	17.0	498.7
14	1,005.1	259.0	120.0	146.0	15.6	23.0	24.2	1,446.9
15	1,086.8	428.0		178.0			27.0	1,541.8
16	1,822.4	484.0					28.2	2,334.6
17	2,480.0							2,480.0
18	2,502.0							2,502.0
Total	10,484.6	2,178.0	475.2	425.1	77.2	83.4	136.0	13,859.5

White pine easily shows the greatest response.

From table III the growth by diameter classes and species was projected for 35 years to form a stand table of the future stand. The volume production in this residual stand is shown in table IV.

It seems that 2139 board feet left in the residual stand now (Table II) assuming no loss

knocked down by the felling.

Twenty-four acres of strip survey were run out in an area which had been studied during the summer. A comparison of the two sets of data—the potential residual stand and the actual—showed what percent of the potential stand was being left. These figures are contained in Table V.

Table V

Showing Reduction in Numbers of Trees of the Potential Residual Stand by Breakage and Other Accidents Incidental to Logging. Expressed in Percent of the Potential Stand Remaining.

D. B. H.	Percent of Residual Stand Remaining
2	45
3	62
4	56
5	60
6	56
7	86
8	40
9	91
10	52
11	38

The figures for this table were not collected by the author, but by the senior class of the School of Forestry under the direction of Dean F. G. Miller.

The application of the figures in Table V to the potential residual stand gives us the volumes which we may expect at the end of 35 years under the present logging practice. These volumes are contained in table VI.

after logging?" The diameter limit discussed here has no scientific foundation that the author knows of. It is one temporarily chosen by the company—one which is conservative for them and which will show the feasibility of incorporating the partial cutting idea into their logging program. A comparison of other cutting limits and what they will produce is shown in Table VII.

Comparison of the three limits in the total column shows that a 12 inch limit leaves 1515 feet more in the residual stand at the time of logging than does the 11 inch limit, but 4422 feet more are produced at the end of 35 years. Comparing the 14 inch limit with the 11 inch, an excess of 4573 feet is left and 9297 feet more are produced in 35 years. Of course a diameter limit cannot be set up accurately until we know just what value in manufactured products is represented by the individuals of a certain diameter class. If the cutting is to be guided by a diameter limit in the woods, it would seem essential to have logging costs

Table VI

Board Foot Volume per Average Acre in Residual Stand at End of 35 Year Period with Allowances for Losses at the Time of Logging of the Original Stand

D. B. H.	Western White Pine	White Fir	Douglas Fir	Cedar	Larch	Lodgepole Pine	Spruce	Totals
7		54.3				1.2		55.5
8	83.8	60.5	10.0	17.4	0.5	0.3	0.9	173.4
9	240.0	81.6	18.3	16.7	0.4	2.4	2.2	361.6
10	163.0	96.5	21.8	31.2	1.2	4.1	6.2	324.0
11			60.0	27.1	23.8	4.2	10.3	125.4
12	448.0	170.2	59.0	80.5	6.9	15.3	4.5	784.4
13		153.4	55.2	108.2	6.4	10.9	6.8	340.9
14	862.0	103.7	45.6	76.0	5.9	8.7	22.1	1,124.0
15	435.0	308.3		67.7			14.1	825.1
16	1,660.0	184.0					10.7	1,854.7
17	1,290.0							1,290.0
18	953.0							953.0
Total	6,134.8	1,212.5	269.9	424.8	45.1	47.1	77.8	8,212.0

Unfortunately the larger diameter classes seem to sustain heavy losses in logging, and the total volumes of the whole stand and of the different species are reduced to about 60% of the volumes found in the potential residual stand. Probably the fallers have not observed the diameter limit very closely, and there can be little doubt that more care in felling the larger trees would save breakage and loss in the residual stand and measurably increase its yield.

Comparison of Diameter Limits

The selection of a diameter limit is a business proposition involving the question, "Does it pay better to cut a certain diameter class now, or to leave it for a period of growth

and the profits of the product also based on diameter classes.

Conclusion

Growth conditions for the white pine type are excellent in the region in which the Clearwater Timber Company is operating. An examination of their lands shows that a large part is covered with timber of the 80-100 year age class. Intensive studies covering 4 sections of this timber shows that the average acre contains a total volume of 37,603 board feet, taking the trees down to 7 inches d. b. h. If a diameter limit of 11 inches is adopted for cutting, the volume removed would amount to 35,464 feet. Allowing for losses in logging the original stand, in a period of 35 years the

residual material will produce a crop of about 8,212 board feet of which 75% is white pine. To test these conclusions a series of eight one acre sample plots have been laid out. These

have been logged, and periodic measurements on them are expected to solve the problem of growth in residual stands in this particular region.

Table VII
Showing Comparison Between Three Diameter Limits, 11, 12, and 14 Inches

Expressed in board foot volumes per average acre in the residual stand at time of logging and again at the end of 35 years of growth after logging. Allowances made for losses during logging

	Western White Pine	White Fir	Douglas Fir	Cedar	Larch	Lodge- pole Pine	Spruce	Total
11 inch limit								
Stand left	1,382.3	337.7	170.5	159.9	30.7	30.4	27.6	2,139.1
Final growth	6,134.8	1,212.5	269.9	424.8	45.1	47.1	77.8	8,212.0
12 inch limit								
Stand left	2,351.5	605.3	329.5	221.9	50.9	46.6	48.6	3,654.3
Final growth	8,219.0	2,741.2	651.1	775.2	111.2	41.1	95.3	12,634.1
14 inch limit								
Stand left	4,555.0	995.0	588.0	335.0	102.0	55.0	81.0	6,712.0
Final growth	11,989.0	3,383.0	910.0	930.0	116.0	49.0	132.0	17,509.0

FORESTRY ALONG THE NORTH AND SOUTH HIGHWAY

By C. W. WATSON

The writer recently had an opportunity to serve in a position unique to the forester. It was on the occasion of the annual congregation of 4-H Club boys and girls at the University of Idaho, at Moscow. These people, usually from 8 to 18 years of age, are members of local agricultural clubs—4-H Clubs. The clubs are sponsored by the agricultural organization, both national and state, and each June, 200 or 300 of the boys and girls with their adult leaders spend a week at the University, learning everything from how to raise a hog to the proper method of making a bed.

The visit entails a long trip for the contingent from the southern part of the state. This year there were about 35 youngsters and leaders who formed a caravan of autos and trucks. Their route to Moscow lay over the famous North and South Highway, a fine surfaced highway traversing a country of tremendous canyons, great rivers, and large forests, a region significant in Idaho history and one of great geologic interest. To interpret the natural wonders to the party and to enable them to grasp the significance of their surroundings, two members of the University faculty, a geologist and a forester, were assigned to the party as technical chaperones. Dr. F. B. Laney officiated as geologist. The

author illuminated the range management and forestry problems. Dr. Laney's intimate knowledge of the region, both geologically and historically, was of great value to the trip. He had, the previous year, made a road log of the route, and copies of this were distributed among the travelers, so that they could, with the aid of the speedometer, identify the various unusual features seen along the road.

We met the party at Starkey Hot Springs in the late afternoon of Thursday, June 9. Introductions were dispensed with quickly, and Laney and I talked a little about the trip ahead of us. They had already taken a swim in the warm pool at the inn, and curiosity led us up the quarter mile of trail to the hot spring. The party watched its sullen, steaming surface while I introduced the native vegetation of the region. For trees we were limited to yellow pine, Douglas fir, cottonwood, and willows, but shrubs and herbs were many and varied. Soon the questions began to flow from amateur botanists, and the conversation flitted hither and yonder throughout the plant kingdom and all of its sciences. My intellect escaped dessication by a fortunate incident—supper.

Supper is the proper word. There were no lunches on this trip. They were dinners, and then some. Breakfast began with a capital B, supper ended with a sigh, and an occasional

bump in the road was the only thing that spared our digestion.

After the evening meal, we drove to New Meadows through the beautiful yellow pines of the Weiser National Forest. In a park-like place there was a band of sheep bedding down for the night. The herder had pitched his tent a little distance away and was smoking a reflective pipe. Nature seemed in a slumbrous mood, so we all turned in with a short prayer for fine weather tomorrow.

Friday brought ham and eggs for breakfast and a fog for weather. It gradually cleared, however. As we left New Meadows we saw that it lay in a round level valley. Everywhere in the valley were hay and pasture lands, a great cattle country. Around the meadow was the forest. Eleven miles through the meadows brought us to the end of the valley. Here we stopped to discuss forestry in yellow pine, and Laney told how the region had been shaped by valley glaciation.

From Round Valley the Little Salmon River leaves to join the Salmon River, 24 miles below at Riggins. The highway follows the Little Salmon, a wild stream, foaming to the banks at this season. This ride, interrupted by a stop to see the falls, was the most beautiful part of the trip. The river falls fast, and its bed is so strewn with glacial boulders, that its course is a succession of rapids. Here we passed through a forest of yellow pine, Douglas fir, lowland white fir, larch, and Engelmann spruce, but 50 miles from Starkey we left the forest to see it only twice more in small patches near Grangeville and Winchester. The remainder of the route lay through the vast unforested grazing lands of the Salmon and Clearwater River Canyons and the great wheat lands of the high plateau.

Riggins, at the junction of the Little Salmon and the Salmon River, is in a mile-deep canyon. The Salmon is a powerful stream, rough and unnavigable. A few have gone down it in boats or on rafts, but many have lost their lives in attempting to do so. The Indians referred to it as The River of No Return, and they advised Lewis and Clark not to attempt its passage in their journey to the coast. Laney knows this country well, and he describes it. "A few miles west of Riggins on the highest peaks of the Seven Devils Mountains which reach an elevation of some 9,400 feet above sea level. This range, located between the marvelous canyons of the Snake and Salmon Rivers is exceedingly steep and rugged and presents some of the most mag-

nificent mountain scenery of the world. Its rugged peaks and crags, its marvelous glaciated valleys, with numerous, indescribably beautiful alpine lakes, with the awe-inspiring Grand Canyon of the Snake River nearly 8,500 feet deep at its western base, affords mountain scenery of unsurpassable magnitude and grandeur."

Riggins is one of the best stopping places on the road. It was proved to us by a chicken dinner. From here the trip followed right along the Salmon River, 31 miles to Whitebird, where the highway leaves the Salmon to follow Whitebird Creek for a couple of miles. Then the traveler climbs out of the Salmon River canyon on the beautiful winding Whitebird grade, 12 miles of road constantly rising on a 4% grade to an elevation of 4,393 feet. The region of Whitebird was the scene of the first battle of the Nezpece Indian War. Here Chief Joseph ambushed the soldiers and defeated them.

The party arrived at Grangeville by late afternoon in a veritable cloudburst, but our spirits were not dampened, and we spent a gay evening. On Saturday we set forth for Moscow, passing through Winchester, Spaulding, and Lewiston. At Winchester the party visited the sawmill of the Craig Mountain Lumber Company. Many of the kiddies had not seen a mill before, and the head saws in particular, charmed them. Spaulding was the scene of the establishment of the first home, the first school, and the first church, west of the Rocky Mountains. Rev. Spaulding with his wife, in 1836, started the Presbyterian Mission here among the Indians on the Clearwater River.

From Spaulding to Lewiston our trail followed the route taken by the Lewis-Clark expedition down the Clearwater River in 1805. At Lewiston, there appeared the new power dam and the new buildings of the Clearwater Timber Company mill. The timber company had graciously invited us to examine their plant and it was a high point in our schedule. Unfortunately time would not permit.

At last we reached Moscow, after escorting the party over about 240 miles of fine roadway through a region which should make of Idaho a great recreational center. The geologist and the forester enjoyed the trip, and we found the party keenly receptive of our efforts. It was real education for these young people to see and understand nature where she is big and beautiful. What a story it will be to tell to those at home!

RANGE MANAGEMENT FIELD TRIP

By "AL" COCHRAN

Forestry students majoring in Range Management have in their Junior year a field trip of unusual value. This is the trip up the Snake River, on which the class collects forage specimens from the surrounding ranges. This is a unique journey, probably unlike any other in this country, certainly different from any taken by a forestry school class. The narrow canyon walls, the muddy swirling river, with its numerous rapids, and the straining, tugging little boat with its cargo of freight, sheepmen, and students make a picture not to be soon forgotten. The homeward stretch is the exciting part as the boat shoots the rapids like a great "shoot the chute" in the parks. The average speed is twenty to twenty five miles per hour on the down river stretch.

This year Mr. Watson was fortunate in being able to take the class to Summers Creek

in Oregon which is about eighty miles up the river from Lewiston. A day was required for the trip. The next day, May 14, was spent in collecting range specimens. This is a bunch grass country and is now a large sheep range. The herbaceous plants were just beginning to bloom on the spring and fall range. Besides the large number of range specimens gathered, the class was able to make a liberal collection of the jingling appendages from the posterior end of some sort of a snake that is rather common to that region. Some of the brave lads attempted to collect specimens for the zoology department but were fortunate in their failure. The boat picked the class up about ten o'clock Sunday morning. They shot the rapids, climbed the Lewiston grade and arrived at Moscow in ample time to make the Monday morning eight o'clocks.

EARLY DAYS IN FORESTRY AT THE UNIVERSITY OF IDAHO

(Continued from page four)

ry an opportunity—a new field in which to render a real service, and that they worked faithfully and well at such courses as we were then able to offer, gaining a fair knowledge of those fundamentals from books, laboratory, and field, which enabled them to "make good."

Valuable Discipline in Early Field Trips

There is probably not a member of the early classes who does not yet recall some of the strenuous hikes which the field work of the early days made necessary. The students and faculty of the department today ride to field work in the college trucks and come home after a hard and profitable day at cruising or other work the same way, and it is far better thus to be, but when forestry at Idaho was first inaugurated the department had no trucks and the faculty and students had to ride the proverbial "Shanks' Mare". It meant earlier rising, long hikes up Moscow Mountain, wet and cold feet, and tired muscles. But Oh! such appetites! I can still see Decker and Favre and Hillman and Thornton ravenously making inroads on the Sour Dough pancakes, black coffee, "Ham and", etc.

Weak Ones Quickly Weeded Out

The early faculty had its own queer ways

of getting rid of the fellow who thought forestry was all play in the woods, a mere summer's vacation on government pay. First the freshman year was "jammed full" of good stiff courses with "exams" to match. This of itself was no mild deterrent, but a six o'clock start to the top of Moscow Mountain in six to twenty inches of snow, a hard days climbing over logs and through the brush at cruising, or running lines with compass or chain up and down hill in two to three feet of snow, and then, a long hike home, in all, around twenty miles, was a test which changed the minds of more than one "snap hunter" as to what forestry was like. He was very apt to feel "Called to preach" or to switch to some course calling for less strenuous exercise and more of the cloistered quiet of the library. We had a few slogans evolved from various trips which had a good effect in "pepping up" the boys with the real "stuff" in them. A few examples follow:

"Remember, the other fellow is tired too."

"Keep smiling if your feet are wet."

"Don't be a baby."

"Don't grouch till after the camp fire is going, then you won't want to."

"Stay with Prof. if it takes the hide off."

A few field trips and a week spent in the logging camps when the snow was deepest,

winding up with a hike from Potlatch over Moscow Mountain with snow waist deep and down its south slope, reaching home after dark, was enough to settle the point as to whether a freshman was forestry material or not. If not, he knew it for sure by this time and no mistake about it.

The course was designed from the beginning to exact more than usual mental and physical effort. There was no attempt to spare either student or faculty. Everybody was energetic but tried his very best to be cheerful, helpful, and courageous. There was plenty of snap and go in all that was undertaken and everybody was made to understand that this was what would be expected of the student who accepted a position in forestry. The hardships which he met in taking his course were only a sample of what he was sure to encounter later, so met it bravely and as a part of the necessary preparation for the future. This was the general spirit of the early days of the forest school, and I am sure it also obtains in no less measure today.

In Conclusion

In this wandering attempt I have tried as best I could to give those who may care to have it a fleeting memory picture of those early years of the small and struggling course, now grown into the University of Idaho School of Forestry. We, like all pioneers, had our hardships and privations, and again like all good pioneers we had our joys and triumphs. We wasted little time in grieving over what we did not have. We were thankful for what we did have, and we made the most of it in every possible way. We soon found that there was much useful work to do and our rapidly growing circle of friends in the U. S. Forest Service and the lumber

business gave us all we could ask—namely, a chance to "make good". We gladly took the chance and our record both past and present must be the answer.

If it may serve to encourage those now preparing in forestry to press forward, and may induce others to enter the great and even yet almost untouched field of forestry in Idaho, I shall be more than repaid for this effort.

To the old students who entered while I was in charge I send greetings, and wishes for your continued success. I have not forgotten a single one of you although I hear from only a few who can find time to snatch now and then a moment from their busy and useful lives to write me even a few lines. It is comforting and sustaining to know that you are laboring in Idaho and neighboring states and that without exception you are living up to the high expectations of myself and my able and faithful colleagues on the forestry faculty during the time we were at Idaho. I am interested in your future and in the present and future of our School of Forestry, its splendid and now imposing faculty, its much more numerous student body, although strangers to me, and in all that pertains to forestry in Idaho.

While my time is now largely taken up with the affairs of a large and rapidly growing business in which I am greatly interested, I shall never forget that one of the largest, most fundamental, important and permanent resources in Idaho is her millions of acres of virgin forests and her billions of feet of highly valuable timber, and I shall always be glad to lend a helping hand to forestry and foresters when the opportunity presents. The field is a noble one and the work worthy of the efforts of the best young men our state can produce.

RELATIVE MOISTURE CONTENT OF RIVER AND RAIL LOGS

By WILFRED F. BEALS, '27

Object of the Study

There has been a great deal of question as to the relative amount of water in logs brought to the mill by rail and those floated by stream. In this paper the term rail logs is taken to mean those logs brought to the mill by railroad, and river logs are those

logs floated to the mill by stream or in booms across a lake.

Each year sees the virgin timber becoming more and more inaccessible. This means a longer freight haul, and today the problem of transportation is one of the lumberman's greatest problems. It is out of

The TIMBERMAN

should be on the desk of every

FORESTER ... LOGGER
LUMBER MANUFACTURER

Its technical articles are authoritative and will
keep you informed on progress in every
branch of the lumber industry



The TIMBERMAN

An International Lumber Journal

616 Spalding Bldg.

PORTLAND, OREGON, U. S. A.

Subscription Rates

United States, \$3 a year Canada, \$3.50 a year

Foreign \$4 a year

the question to think of shipping lumber today without first drying it. The lumber can be piled and left to air dry, but this is expensive, since it takes several months, and the capital tied up is inactive. Checking and sapstain are more liable to take place in the air seasoning process, and this lowers the grade and value of the product. This seasoning can be carried on rapidly by means of dry kilns in which the lumber is brought to an air dry condition in a shorter time. The time varies with the species, size of board, moisture conditions, whether heart or sapwood, and with the amount of heat and humidity in the kiln. The operation of a kiln is quite an expense, so every hour the lumber remains in the kiln, the expense of production is increased. The greater the moisture content, the longer it will take to bring the lumber to an air dry condition. The object of this experiment is thus to determine the difference in moisture content between river and rail logs of western white pine (*Pinus monticola*), and if possible ascertain the relation of this variation in moisture content to the seasoning processes, also its effect on the lumber, such as shrinkage, checks, warps, cups, etc.

Apparatus

The kiln used is of the (miniature) fan blower type. It is heated by means of steam coils. One pipe is perforated and is used to furnish live steam in the early stages of drying, so that excess of checking and warping may be prevented. Circulation is obtained by means of an electric fan. One of the features of the kiln is a metal plate with holes evenly distributed over it. This plate is between the steam pipes and wood. The fan forces the hot air thru these holes, thus giving an even distribution of air. By this method the wood is evenly dried, while without the metal plate the hot air would rise to the top and the top boards dry out first. Cross pieces of seasoned Douglas fir were used, on which the pine boards were piled in the kiln. Calpiers and scales were the only other apparatus needed.

Material

The boards were cut from western white pine (*Pinus monticola*), approximately 1"x10" x24" in size. Thirty-five samples of river logged heartwood were run, and thirty-two

samples of river logged sapwood. Only ten samples of rail logged sapwood and twelve of heartwood were run. This was because it was impossible to get any more samples of rail logged material. The weights of the boards were taken at the mill and then checked with weights taken on arrival at the laboratory.

The river logged material was transported by water and held in the mill pond for a period of seven months, while the rail logged material was dumped in the pond only a few days prior to cutting.

Method of Procedure

The material was shipped in paper lined wooden boxes so that as little loss of moisture could take place as possible. Immediately upon arriving in Moscow, the pieces were weighed to the closest one half gram, and thickness and widths were taken to the nearest one hundredth of a centimeter. The boards were next placed in the kiln and the steam turned on. The boards were piled so that there would be crossers between each two layers of boards. In laying the boards on the crossers, the ends were not allowed to extend over the edge of the crossers. In this manner the ends did not dry out too rapidly and end checking was diminished. The crossers were laid parallel to the direction of the air current so that complete circulation was obtained.

The temperature in the kiln was started at 185°F and gradually increased to 203°F. For the first hour the live steam was turned on so as to minimize the checking; and after seventeen hours the steam was again turned on, but for only one half hour. The boards were left in the kiln for a period of forty-eight hours, and then they were removed and carefully weighed. This was taken as the kiln dried condition. They were then replaced in the kiln and left until a constant weight was reached. The boards were then removed and a final weighing made, thus making it possible to determine the total moisture content of the lumber. After being taken out for the last weighing, the boards were again measured for thickness and width. The measurements were taken at the exact point of the first measurements, thus eliminating any errors which might be due to inexact sawing. Shrinkage values were then determined. The moisture content remaining in

Exponents of Industrial Forestry

Lumber manufacturers are finding ways to apply forestry principles to the handling of their wood lands.

Such applications involve consistent and well planned programs of

Fire protection for all lands

Insect control operations

Selective logging in pine

Improvement thinnings

Forest nursery development

Replanting in cutover areas

By-products research

All these activities are going forward on a commercial scale in the Southern and Western operations of

The Long-Bell Lumber Company

R. A. Long Bldg., Kansas City, Mo.

the wood at the end of the kiln run was also determined.

The kiln conditions of all runs were duplicated as nearly as possible, so that all data obtained would be as nearly on the same basis as could be obtained.

All percentages of moisture content were worked out on the basis of the oven dry weight. That is, the formula $\frac{W-D}{D} \times 100$ equals the moisture content, was used.

Where—

W equals wet weight.

D equals dry weight.

The shrinkage values were also worked out on the dimensions after drying, by the formula $\frac{W_1-D_1}{D_1} \times 100$.

Where—

W₁ equals wet dimensions.

D₁ equals dry dimensions.

TABLE No. 1
Shrinkage in Thickness for River Logs

No. of Samples		Average shrinkage in %
20	heartwood end thickness	3.805%
20	" edge "	4.762%
*15	" edge "	4.280%
20	sapwood end thickness	3.16 %
20	" edge "	3.74 %
*12	" edge "	4.42 %

* In this set of samples edge thickness measurements only were taken.

TABLE No. 2
Shrinkage in Thickness for Rail Logs

No. of Samples		Average shrinkage in %
15	heartwood end thickness	4.770%
15	" edge "	4.790%
10	sapwood end thickness	3.69 %
10	" edge "	3.51 %

TABLE No. 3
Shrinkage in Width for River Logs

No. of Samples		Average shrinkage in %
15	heartwood	5.91 %
20	"	5.29 %
12	sapwood	5.78 %
20	"	5.14 %

TABLE No. 4
Shrinkage in Width for Rail Logs

No. of Samples		Average shrinkage in %
15	heartwood	3.97 %
10	sapwood	5.35 %

Edward Rutledge Timber Co.

—Manufacturing—

Weyerhaeuser Forest Products

—SPECIALIZING IN—

Idaho White Pine

FINISH, PATTERN, TEMPLATE, FLASK,
CRATING LUMBER

COEUR D'ALENE, IDAHO

Idaho Fire Brick Co.

MANUFACTURERS

THE TROY, IDAHO, FIRE BRICK

OFFICE AND FACTORY AT

TROY, IDAHO

Bricks of any shape made from selected clays for boiler settings

Extra hard brick made for refuse burners

Special Attention Given Special Orders

TABLE No. 5
Moisture Content in River Logs

No. of Samples		Total moisture content	Moisture content kiln dried
15	heartwood	78.26 %	4.56 %
*20	"	72.43 %	—
12	sapwood	86.59 %	3.19 %
*20	"	117.29 %	—

* Weights were not taken at end of 48 hours. Oven dry weights only were recorded.

TABLE No. 6
Moisture Content in Rail Logs

No. of Samples		Total moisture content	Moisture content kiln dried
*10	heartwood	55.32 %	.326%
15	sapwood	45.86 %	.217%

* Higher moisture content in heartwood than sapwood due to water core.

Summary

Tables 5 and 6 show a comparison of the moisture content of the logs transported under the two conditions. The river driven logs showed much the greater percentage of moisture, as would be natural to suppose. After forty-eight hours in the kiln the river logs contained a much higher moisture content than the rail logs. It required fifty-four hours to bring the rail log samples to a constant weight. In the case of the river logs, one set required 54 hours, while the other required 72 hours to bring to oven dry conditions. These two samples were run under the same conditions. This shows how kiln runs may vary with samples which seem very much the same. These time studies do show, though that it will take longer to bring river logs to a constant weight under the conditions used in these tests.

In table 6 it will be noted that the heartwood had a greater moisture content than the sapwood. This was due to the fact that thirty-three percent of the heartwood samples of the rail logs showed water core. This is a type of defect quite common in the heartwood of the white pine. It is characterized by a darker color in the heartwood and is due to free water within the cells. Its relation to seasoning is being studied by Dr. E. E. Hubert of the University of Idaho School of

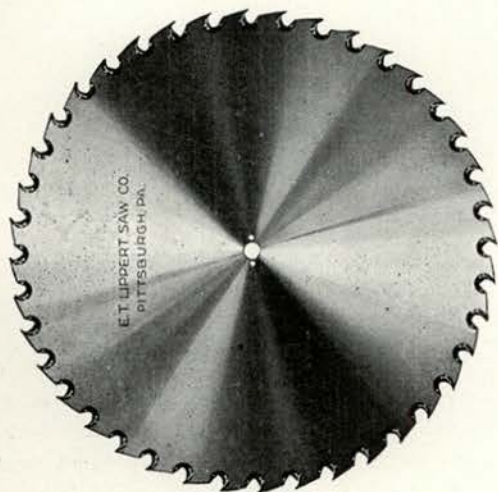
Forestry. The water coring did not seem to affect the seasoning of the boards, except in the case of warping. The water cored boards did show excessive warping. The warping in all cases was away from the pith. That is, if a board is cut with the pith on one side of it, it will curve away from it. Or if a board is cut tangentially from a log it will warp away from the center. This checks with studies on warping by S. J. Record.

The temperatures and humidity in the runs were not the same as would be found in an ordinary large kiln run, though the boards came out in quite good condition, and not an undue amount of checking was found. Possibly the warping in the water cored boards might have been reduced by raising the humidity and causing slower and more even drying.

Some very interesting figures may be worked out from the average wet and dry weights of the boards. Table 7 shows the weights of lumber per thousand board feet under the different conditions. These figures show the great advantage of kiln drying the lumber before shipping. In the case of river sapwood the difference is more than sixteen hundred pounds per thousand board feet, or a reduction of 45% of weight. Rail sapwood showed a loss of over nine hundred pounds and a reduction of 32% of the net

LIPPERT ^{INSERTED TOOTH} ^{SOLID TOOTH} SAWS

for All Kinds of Saw Mills



We make saws for all kinds of mills—Lippert Saws run equally well with electric, steam, tractor or water power.

*Lippert Saws Cut
Fast and Smooth*

Lippert Saws are made of the finest steel obtainable, evenly tempered and accurately balanced; and the workmanship is of the highest quality.

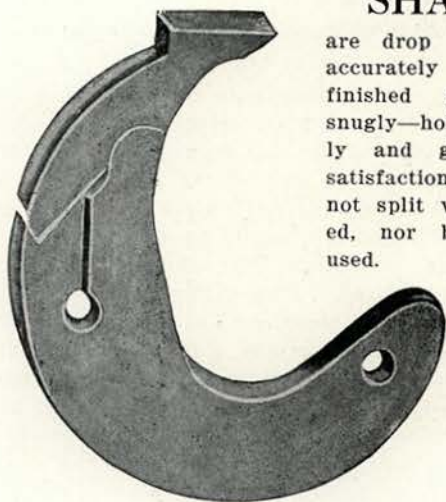
*Lippert Saws—
Save Time, Power
and Timber*

LIPPERT BITS

with drop forged groove are assured an absolute central bearing in the plate giving uniform clearance which means longer wear. They are of even temper and uniform finish.

LIPPERT SHANKS

are drop forged and accurately milled and finished fit sockets snugly—hold bits firmly and give lasting satisfaction. They do not split when inserted, nor break when used.



E. T. LIPPERT SAW CO.

PITTSBURGH, PA.

WHERE PRICE AND QUALITY MEET

weight. Rail heartwood showed a greater loss than the sapwood, but this was due, as explained before, to the presence of water core.

An article written by Mr. M. Bradner in the January, 1926 "Timberman" tells of the

greater amount of blue stain found in river logs, and the loss in volume due to booming in the river logs. So aside from the greater moisture content in river logs there is a loss in grade and volume.

TABLE 7

Weight per M bd. ft. of Lumber

	Green wt. per M bd. ft.	Kiln wt. per M. bd. ft. Pounds	Diff. Pounds
River sapwood	3648.2	2023.7	1624.5
River heartwood	3290.8	1861.6	1429.2
Rail sapwood	2945.6	2027.0	918.6
Rail heartwood	3025.2	1879.4	1145.8

A. W. TOOLE, '27, APPOINTED DEPUTY STATE FORESTER

Mr. A. W. Toole of the Class of 1927 has accepted an appointment to the office of Deputy State Forester to the State of Idaho, succeed-



A. W. Toole
Deputy State Forester

ing E. W. Renshaw, who resigned to return to the U S. Forest Service.

Mr. Toole is a native son of Idaho and has grown up in a forest environment. He, therefore, has a "woods sense" which makes him the valuable field man that he is. He was prepared for the University in the Lapwai High School, and entered here in September,

1922. He was self-supporting and so dropped out one full year in order to earn funds to put himself through. This year in the field, together with the summers spent there, enabled him to acquire much practical experience as a background for the position he now accepts. Mr. Toole passed the examination for the position of junior forester last spring and was offered a position in the Forest Service.

School Enjoys Visit from German Forester

Within the past year, the School of Forestry had the pleasure of entertaining Dr. J. A. von Monroy, a German forester of note, who stopped off in this region for several days in his tour of inspection around the world.

Dr. von Monroy spent some time with the School in its work on the holdings of the Clearwater Timber Company where he became greatly interested in the logging methods employed by this company. His special line of investigation was labor saving devices in logging, and he found conditions in the Clearwater region as to size of timber more nearly comparable to conditions where he was wanting to introduce American logging methods than in any other region he had visited. von Monroy stated that the use of labor saving devices had become acute in Germany since the war.

HOW THE GRADUATES ARE EMPLOYED

The notes concerning the Alumni published in another part of this issue show the graduates of the School of Forestry to be engaged in a wide range of activities. It is of interest to note that of the sixty-five living graduates, eighty per cent, or fifty-two are engaged in some phase of forestry work.

Of these fifty-two, twenty-three are in the government service, three are in state work, two are connected with state forestry in India, two are on the faculties of universities, twenty are in the employ of private concerns, mostly lumber companies, and two are doing graduate work at Yale.

A further analysis shows the graduates to be widely scattered. Two, as mentioned, are in state forest service in India, two others will return to the forest service of the Philippine Islands this fall, one is in the forestry department of North Carolina, and one is deputy state forester to Idaho. Assistant professor of forestry in the University of California is the title of one alumnus, and another holds the same title in the State College of Michigan. The California Fruit Growers Supply Company employs two of our graduates in prominent positions, one as logging superintendent and the other as forester to the company. Manager of the cedar pole department of a large lumber company indicates the important field one man occupies, and one is engaged as land agent by another prominent lumber company. Chemist to the eastern division of the Southern Pacific Railroad Com-

pany is the title of another, and one graduate is in charge of the dry kiln department of the Clearwater Timber Company. Another is field draftsman for the same company.

One graduate is a forest supervisor in the Forest Service, and three are deputy supervisors. Another is prominently identified with forest fire cooperation for the Forest Service in Montana and northern Idaho. Assistant range examiner, U. S. Biological Survey, Fairbanks, Alaska reads the title of another, and still another is extension forester to Idaho. One man is forest pathologist in the U. S. Department of Agriculture.

Of those not now engaged in the profession of forestry, one is an attorney at law and a prominent member of the Idaho legislature, one is a doctor of dentistry, one is a major in the U. S. Army, another is district engineer of the Pacific Telephone and Telegraph Company in California, and still another is a prominent realtor in Seattle. Others whose activities may not be specifically pointed out are engaged in useful labors.

Thus it is that the graduates of the School of Forestry are giving a splendid account of themselves and are reflecting great credit upon the School. All are still young men, and are really just well started on the road to achievement. The success of the School and that of the men it turns out are interdependent. Now that the body of alumni is increasing rapidly in numbers, so likewise the School is growing, both in service and influence.



ROSTER OF STUDENTS

The following is a list of students in actual attendance at the School of Forestry during the year 1926-27, with their home addresses:

Graduate Students

Nettleton, H. I., B. S. (For.) (1921 Oregon Agricultural College,) Moscow, Idaho.

Sowder, A. M., B. S. (For.) (1921 Oregon Ag-of Idaho,) Coeur d'Alene, Idaho.

Seniors

Baird, John C., 2432 N. Rockwell St., Chicago, Ill.

Beals, Wilfred F., Okanogan, Washington.

Burroughs, Isaac C., 44 Kelsey Road, Poughkeepsie, N. Y.

Callender, William C., 1606 N. 12th St., Boise, Idaho.

Davis, Robert, 762 W. 3rd St., Riverside, Calif.

Godden, Floyd, River Falls, Wisconsin.

Greene, Edwin G., 218 So. Almond St., Moscow, Idaho.

Gustafson, Carl A., 610 W. 26 St., Vancouver, Washington.

Heggie, Tracy L., Montpelier, Idaho.

Hoffman, Henry C., 43 W. North St., Galesburg, Ill.

Johnston, Royal C., 11 Stuart St., Everett, Mass.

Lansdon, William H., 1502 N. 6th St., Boise, Idaho.

Lehrbas, Mark M., Box 304, Pocatello, Idaho.

Phelps, Eugene V., Carlinville, Illinois.

Pike, Galen W., East Woodstock, Connecticut.

Saling, Wallace M., Weippe, Idaho.

Space, Jackson, W., Orofino, Idaho.

Toole, Arlie W., Marshfield, Oregon.

Walrath, Fairly J., Orofino, Idaho.

Williams, Guy V., 704 McKinley St., Boise, Idaho.

Juniors

Bennett, Carey H., 579 24th St., Ogden, Utah.

Biker, John B., Nelson, B. C., Canada.



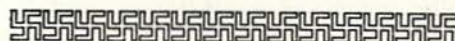
Do Your Banking

at

MOSCOW STATE

BANK

Moscow, Idaho



CLIMAX GEARED

LOCOMOTIVES

All Steel Construction

Deep Main Frame

Piston Valves

Walschaert Motion

Vestibuled Cab

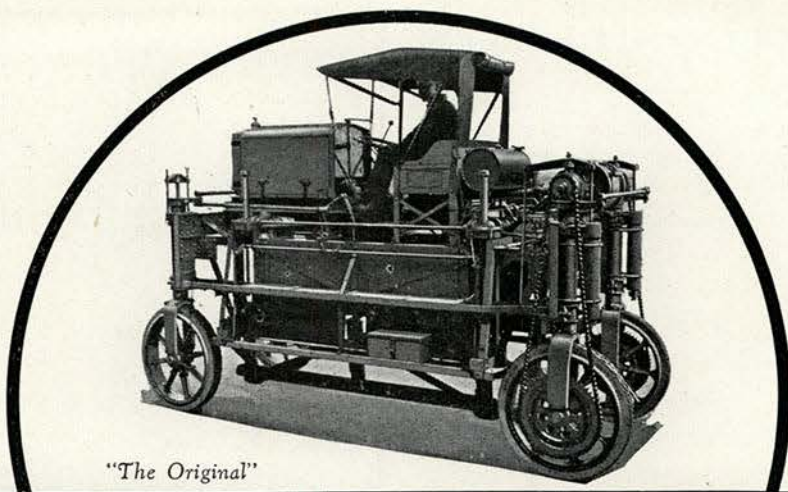
Super Heater
if desired

Alemite Lubrication
controlled from cab

CLIMAX LOCOMOTIVE Co.

623 Western Ave.

Seattle



"The Original"

The Ross Carrier Solved One of the Big Lumber Problems

ONE of the big problems of the lumber industry used to be the handling and moving of lumber at the mill and in the yard.

Old methods required the handling of truck or dollie loads, board by board—sometimes several handlings—a slow, laborious and costly process.

By making it possible to handle lumber, not in board units but in load units, the "Ross" introduced a new era into lumber handling methods. Many mill men regard it as one of the greatest contributions to efficiency and economy ever made to the lumber industry.

The "Ross" was the original straddle truck and has kept so far ahead of imitative devices that it has never had serious competition. It alone has 4-wheel steer, enabling it to make sharp turns and to work in crowded quarters. Its flexible frame construction has been proven structurally correct by experience. It is now made with 3 speeds in reverse as well as forward.

Speed is the Ross Carrier's "middle name"! It drives astride the load, picks it up and is under way in 30 seconds or less! See it in operation at some local mill.

Over 500 Ross Carriers now in use—proof that its superiority is widely recognized.

ROSS CARRIER COMPANY

Plant and General Offices, Benton Harbor, Mich.
New York Office, 1044 Grand Central Terminal Bldg.

MURRY JACOBS COMPANY

DISTRIBUTORS
472 Monadnock Bldg.
SAN FRANCISCO

69 Columbia St.
SEATTLE

744 Audubon Bldg.
NEW ORLEANS

- Cochran, Allan R., Sunbury, Ohio.
- Connaughton, Chas. A., 1108 Jefferson St., Boise, Idaho.
- Ellis, Francis Gordon, 4860 D. Street, Idaho Falls, Idaho.
- Flack, Gordon L., 2017 W. Jackson, Spokane, Wash.
- Gregory, Chas. A., 5812 N. Virginia Ave., Chicago, Illinois.
- Hatch, Alden Bruce, Y. W. C. A. Philadelphia, Pa.
- Icarangal, Primo E., Pangil, Laguna, P. I.
- Mitchell, William W., 1105 Madison St., Wilmington, Del.
- Otter, Floyd L., 602 S. Adams St., Moscow, Idaho.
- Rowe, Percy B., 113 N. Washington, St., Moscow, Idaho.
- Seymour, Wellington, 111 McKinley Place, Monrovia, Calif.
- Sheldon, William S., 86 Mariner St., Buffalo, New York.
- Spence, Liter E., 307 Vine Ave., Park Ridge, Ill.
- Williams, Floyd E., Rosalia, Washington.

Sophomores

- Axtell, Donald H., 2604 W. Dalton, Spokane, Washington.
- Balch, Prentice, E. 703 Wabash Ave., Spokane, Wash.
- Bollinger, Roy E., 210 Broadway, Boise, Idaho.
- Boyd, Buford K., 414 Jefferson, Moscow, Idaho.
- Buckingham, Arthur, Gifford, Idaho.
- Ficke, Herman, Payette, Idaho.
- Fritchman, Holt, Naches, Washington.
- Frost, Levi M., 619 So. Santa Fe St., Salina, Kansas.
- Gries, George C., 3142 Diversey Ave., Chicago, Ill.
- Hjort, George V., Kooskia, Idaho.
- Hume, John Fred, Jr., Inland Hospital, Moscow, Idaho.
- Illichevsky, George J., 609 Deakin Avenue, Moscow, Idaho.
- Kayler, Dean C., Winchester, Idaho.

MOSCOW STEAM LAUNDRY

and Dry Cleaning Works

—
New
Prosperity Method
of Cleaning of Pressing

—
C. B. GREEN, Prop.

J. S. Grocery

PHONE 307

A grocery home for discriminating trade.
30 day credit invited.
Free delivery in the city

All Trophies Used at the
U. of I.

furnished by

**BOLDING'S
JEWELRY STORE**

Third Street

THE STUDENTS' JEWELER

J. O. BALLARD & CO.

MALONE WOOLEN MILLS

MALONE, NEW YORK



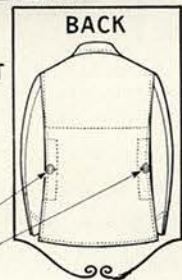
BALLARD SHIRT
MODEL 1
AND LACED BREECHES

We also
Equip
New York
State
Rangers
With
Uniforms

Made from
Our Goods



BALLARD
HUNTING SHIRT
MODEL 4



"Malone Pants"



J. O. Ballard & Co.

ASK ANY ONE WHO HAS EVER WORN ANY
OF OUR GOODS

Kennedy, Fred H., Dubois, Idaho.
 Lindsay, Clive John, Hazelton, Idaho.
 Newcomb, Lawrence C., Coeur d'Alene, Idaho.
 Olson, Martin M., Rushford, Minn.
 Parnell, Keith M., 507 Euclid Ave., Lynchburg,
 Va.
 Roselle, Martin B., Elk River, Idaho.
 Seeley, Theo. A., Moscow, Idaho.
 Stanley, Wilfred B., E. 12 27th Ave., Spokane,
 Wash.
 Stowasser, Clarence, 525 W. Summitt Ave.,
 Coeur d'Alene, Idaho.
 Sumsion, Alma B., Chester, Utah.
 Wendle, Rex, Sandpoint, Idaho.

Freshmen

Adair, Sidney R., Potlatch, Idaho.
 Anderson, Milton, Firth, Idaho.
 Auger, Fred S., Winchester, Idaho.
 Buchanan, Thomas S., Morton, Washington.
 Burton, Cary L., Belle Plaine, Kansas.
 Cherry, Howard C., 87 N. Stout, Blackfoot,
 Idaho.
 Coleman, William W., Box 36, Cascade, Idaho.
 Criser, Geo. A., Jr., Alabama City, Alabama.
 Crosthwait, Lynn D., Maxwell, New Mexico.
 Croy, John A., 1117 7th St., Clarkston, Wash.
 Drysdale, Robert D., New Plymouth, Idaho.
 Fisher, George M., 220 Main St., Ames, Iowa.
 Forster, Norman B., Box 34, Orofino, Idaho.
 Goodwin, Cardinal W., 1167 Monticella, Pied-
 mont, Calif.
 Halverson, Andrew G., Route No. 1, Kimberly,
 Idaho.
 Hawker, Elmer A., 811 Sylvester St., Pasco,
 Washington.
 Hockaday, James M., 1027 Deakin Avenue,
 Moscow, Idaho.
 Jemison, George M., 2614 N. Stevens, Spokane,
 Washington.
 Krummes, William T., 1316 E. Bannock, Boise,
 Idaho.

COLD STORAGE MEAT MARKET

The home of

QUALITY MEATS

Phone No. 7

J. T. CROOT

TAILOR TO MEN AND WOMEN

Dealer in

Domestic and Foreign Woolens

Phone 231-J 111 West Third Street

MOSCOW, IDAHO

Insist on

MOSCOW-MAID and GOLD CRUST

BAKERY PRODUCTS

Electric Bakery

Moscow, Idaho

Main 2621

PERINE MACHINERY CO.

MACHINERY MERCHANTS

ENGINEERS

209 First Avenue South

Seattle

Schroeter's

Butter-Krust Bread

at

EMPIRE BAKERY

Retail and Wholesale

Third Street

Moscow, Idaho

Main 250

FOREST PERPETUATION



THE NORTHWESTERN STATES—Oregon, Washington and Idaho—possess well over one-third of the Nation's supply of saw timber.

While embracing only a small part of the forest land area of the United States, the region is, in general, one of high productivity and, consequently, of real importance from the standpoint of the Nation's present and future timber supply.

Throughout this region, forest industry has, in the past, and, for many years to come, will play a principal part in its industrial progress. Possessing, as it does, raw material sufficient to supply its industries for many years, there is still in the Northwest time and opportunity to plan for needs of the industry after present merchantable supplies are exhausted.

Most of our Eastern States gave little thought to forest perpetuation until their mature timber had been removed. They are now slowly building back their forests, but, in the meantime, many of their industries have ceased to exist or found it necessary to seek more favorable locations.

Our Northwestern States should be warned by what has happened elsewhere and begin at once to plan for the future. In considering forest growing, we must not lose sight of the fact that a very long period is required to mature a crop. Vision, far-sightedness and careful planning are necessary in dealing with this question, and hence the need for speedy but not ill-considered action.

Companies, and individuals owning forest land, are becoming actively interested in possibilities of successive crops on their properties. Our States are slowly advancing toward policies which will encourage and foster perpetuation, and the Federal Government is taking similar action.

Not, however, until our various States adopt definite and clean-cut policies with regard to forest protection and forest taxation, can the private owner figure with the necessary degree of definiteness upon the financial outcome of an investment in forest growing.

Reforestation of our denuded areas is not the problem of any particular group or class of people. It is a matter which vitally concerns everyone. And, for this reason, it behooves our States to aid so far as is reasonable and possible in putting the business of timber growing on a sound financial basis.

In this Northwest country, we are not fearful of a timber shortage which will extend to our needs for local use. At the present time, however, a large part of our production is to supply the demands of other regions. With a vast land area suited only to forest growing, there is every reason for the permanent maintenance of an industry which can continue to supply material not only for local use but for those regions not so favored by soil and climate to the production of forest crops. Forest growing, therefore, becomes a problem of land use and payroll maintenance.

To make sure that our land is put to beneficial use and payrolls continue to increase, all agencies must assume definite responsibility and work to a common end.

Forest protection and tax reform are two of the principal problems to be solved, and, in their solution, the student bodies of our Universities, and particularly those attending our Forest Schools, should take a prominent part.

Weyerhaeuser Timber Company

Langer, Charley J., 8035 S. Washington, Moscow, Idaho.

LeBarron, Russell K., 810 Rosser St., Bismark, N. D.

Mershon, W. Faber, 2221 Lynn, Williamsport, Pa.

Minch, Francis Watt, Colfax, Washington.

Nass, Herman Wm., Outlook, Washington.

Norby, Arthur Marvin, Rupert Idaho.

Remington, Carl A., 12 St. Elmo Road, Worcester, Mass

Riley, Arnold D., 1511 Prospect St., Lewiston, Idaho.

Sargeant, Howard J., Box 65, Granger, Washington.

Shaw, Carl Ingram, 916 Denver St., Caldwell, Idaho.

Stahl, Earle E., Rigby, Idaho.

Taylor, Cyprian D., R. R. 1, Nelson, B. C., Canada.

Whiting, Harry L., 2414 16th Ave., Spokane, Wash.

Wilde, Manin B., 514 So. Washington, Spokane, Wash.

Wood, Don George, Morton, Washington.

Rangers

Albright, Earl, 1292 Elm St., El Paso, Texas.

Cazier, Samuel Edwin, 309 Asbury St., Moscow, Idaho.

Daugherty, Charles, Weed, California.

Fowler, Richard A., Nakusp, B. C., Canada.

Hall, Nelson E., Sandpoint, Idaho.

Hawk, Lawrence W., 4102 Beloit Road, Milwaukee, Wis.

Neave, Edward W., Junction City, Oregon.

Robinson, George T., Proctor, B. C., Canada.

Scribner, John Perry, Chattaroy, Washington.

Stilwell, George G., Weiser, Idaho.

Tanner, Bahrd, Jackson, Wyoming.

Thurston, Chas. H., Jr., 875 Hoover, St., Roseburg, Oregon.

Wood, Bruce, Plains, Montana.

The Moscow Fire Brick and Clay Product Co.

Manufacturers

HIGHEST GRADE REFRACTORIES

Fire Brick, Face Brick, Common Brick
and Hollow Tile

TOM HALL, President and Manager

H. B. MICKEY, Secretary-Treasurer

MOSCOW PUBLISHING COMPANY



A COMPLETE
PRINTING
SERVICE

• • •

MOSCOW, IDAHO

Sager Chemical Process AXES and BULL DOG Logging Tools

Recognized All Over the United States as
the BEST Money and Skill can Produce



WRITE FOR CATALOG

Comfort, Convenience, Wear ... in this Filson Cruising Coat



*"Filson Clothes for the
Man Who Knows"*

It's wind-tight and water resistant (water-proofed Khaki)—gives real protection in severest storms, yet is light enough for all-season wear. Double shoulders, double sleeves and lots of pockets. A quality outdoor coat, most reasonably priced. "Might as well have the best." Order 1 inch larger than white collar size.

Our complete illustrated catalog of Better Outdoor Clothes tells all about the Filson Mackinaw Cruising Coat, Filson Hunting Coat, Filson Laced Breeches, Filson Sleeping Bag and the many other items of wear for the outdoor man. It's free. Write for a copy today.

C. C. FILSON CO.

1005-1007 First Ave.

Seattle, Wash.

Adds a Car of Logs a Day!



TRADE MARK
REG. U.S. PATENT OFFICE
TOOTS-E

The Logger's Electrically-Operated Steam Signal

TOOTS-E is always on the job—adding a car of logs a day.

No country too rough; no distance too great for Toots-E.

The Whistle-punk can run cable—under track—over hills—through the brush—anywhere—anyplace.

Just press the signal handle and Toots-E toots.

Write to our Seattle Office for additional information and descriptive literature.

Manufactured and sold by:

C. M. Lovsted & Co.

2213-2214-2216 First Ave., So.
Seattle, Wash., U.S.A.

OUTDOOR CLOTHES *for* MEN

Filson Cruiser Coat

Made of Shepel Kaki

No. 55, single sleeve,
sizes 15 to 18 \$5.50

No. 65, double sleeve,
sizes 15 to 18 \$6.50

We carry a complete line of
Filson duck and wool cloth-
ing, also Malone pants, stags,
cruisers shirts



Logger Shoes and Pacs

16 inch Russell	\$12.05
12 inch Russell	13.50
8 inch Bergmann	13.75
10 inch Bergmann	15.00
12 inch Bergmann	19.50
8 inch Currin	13.75
10 inch Currin	15.00
12 inch Currin	19.50
8 inch Jefferson	9.50
Cabbing	1.00
Hobbing50



SEND FOR
CATALOG
AND
PRICES



SEND US
YOUR MAIL
ORDERS
We Pay Postage

MISSOULA, MONT.

LEWISTON, IDAHO