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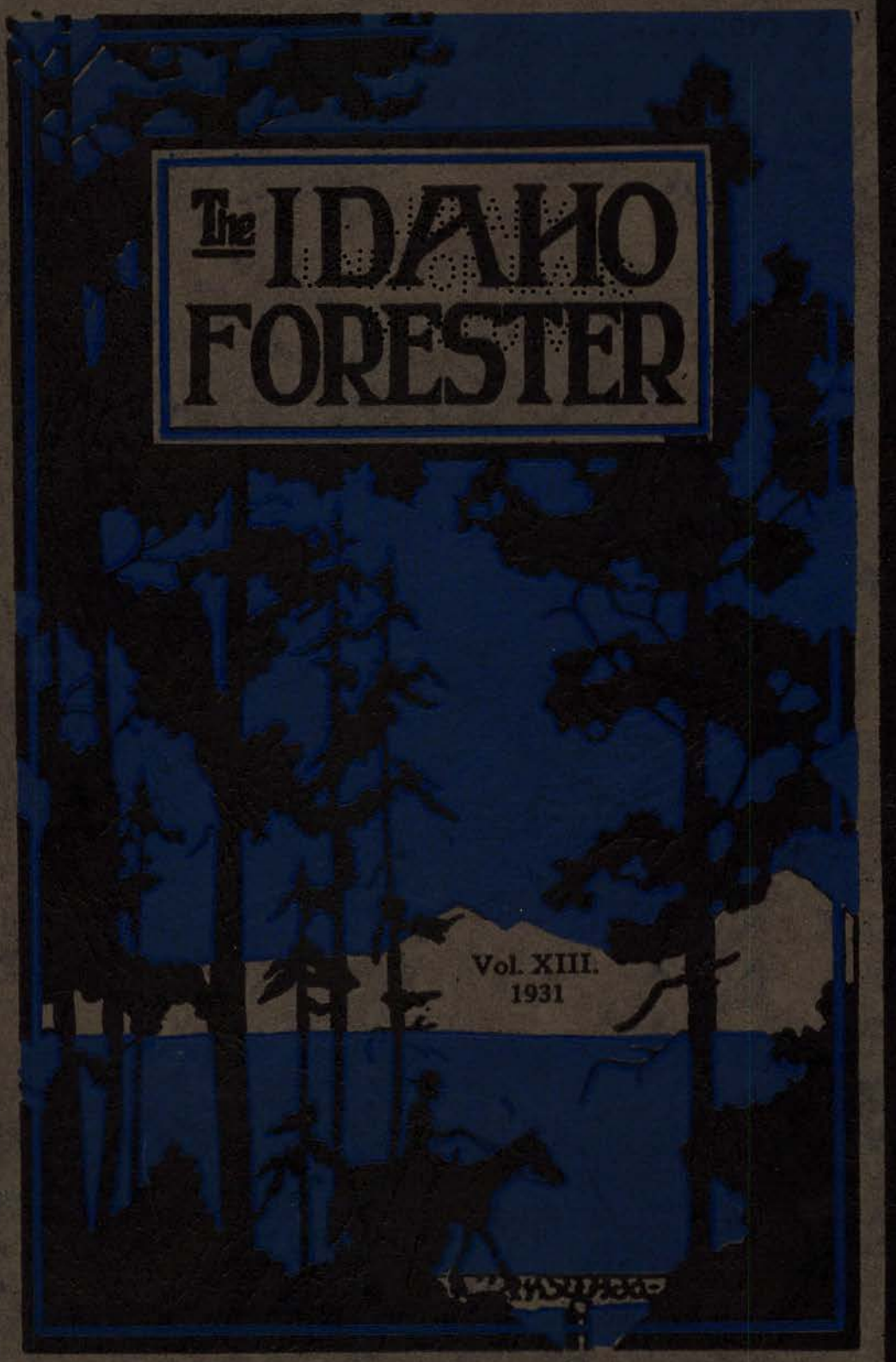

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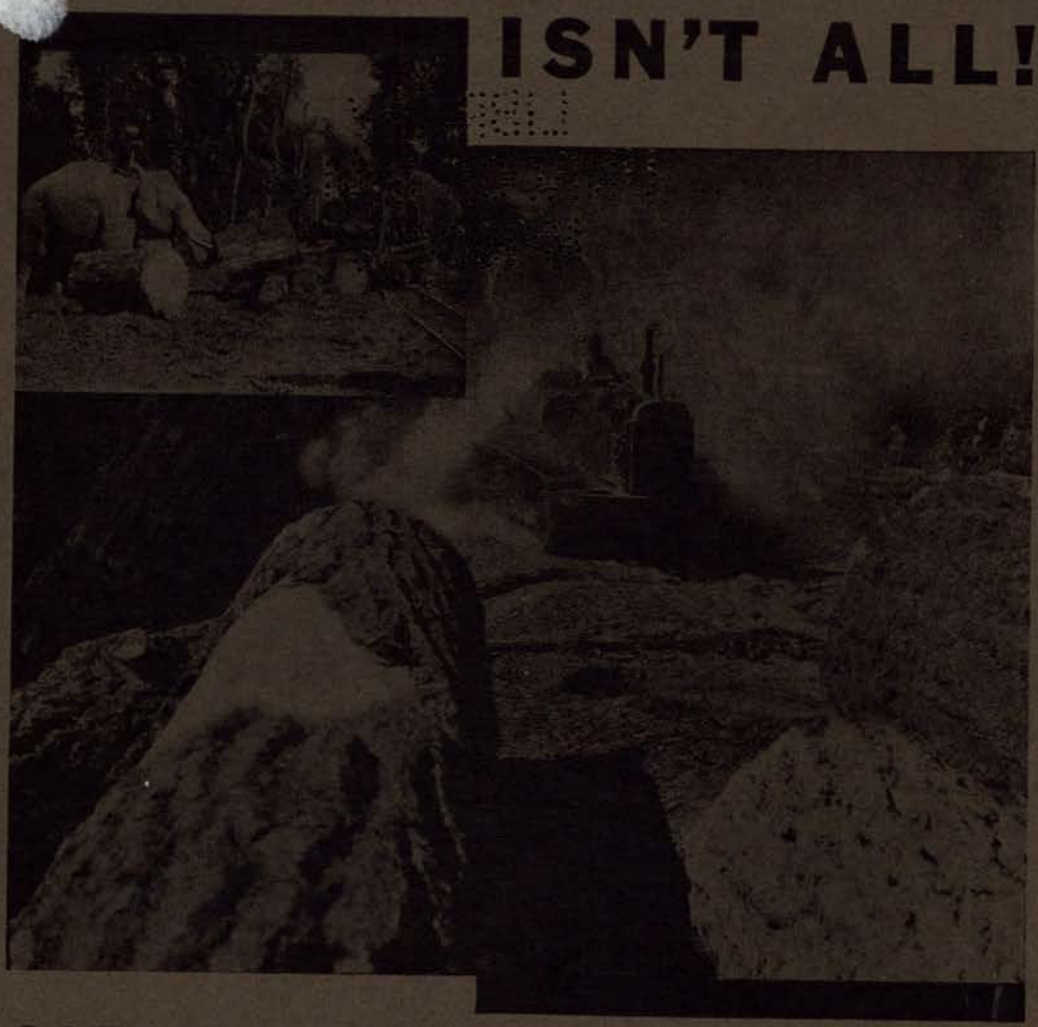

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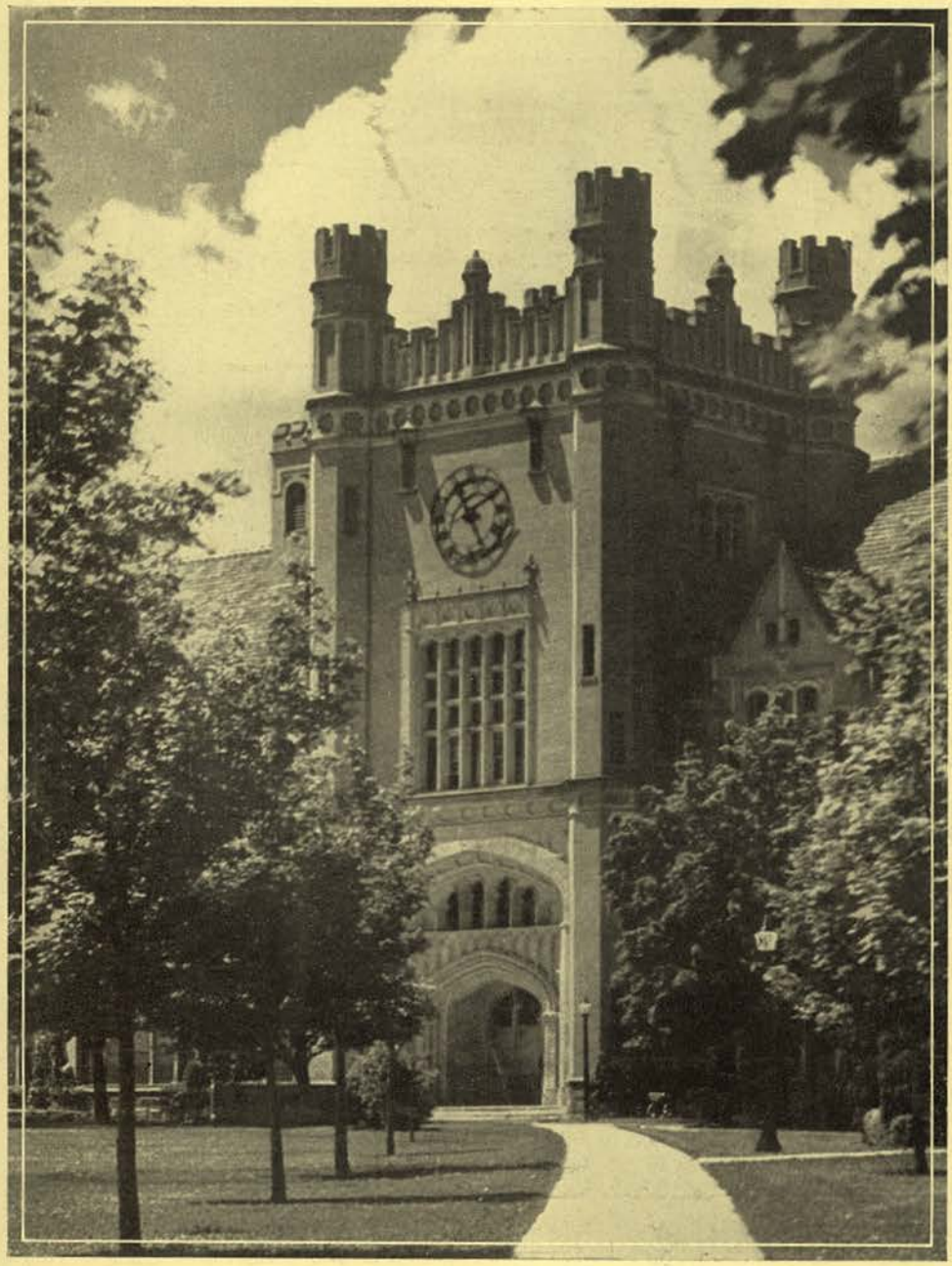
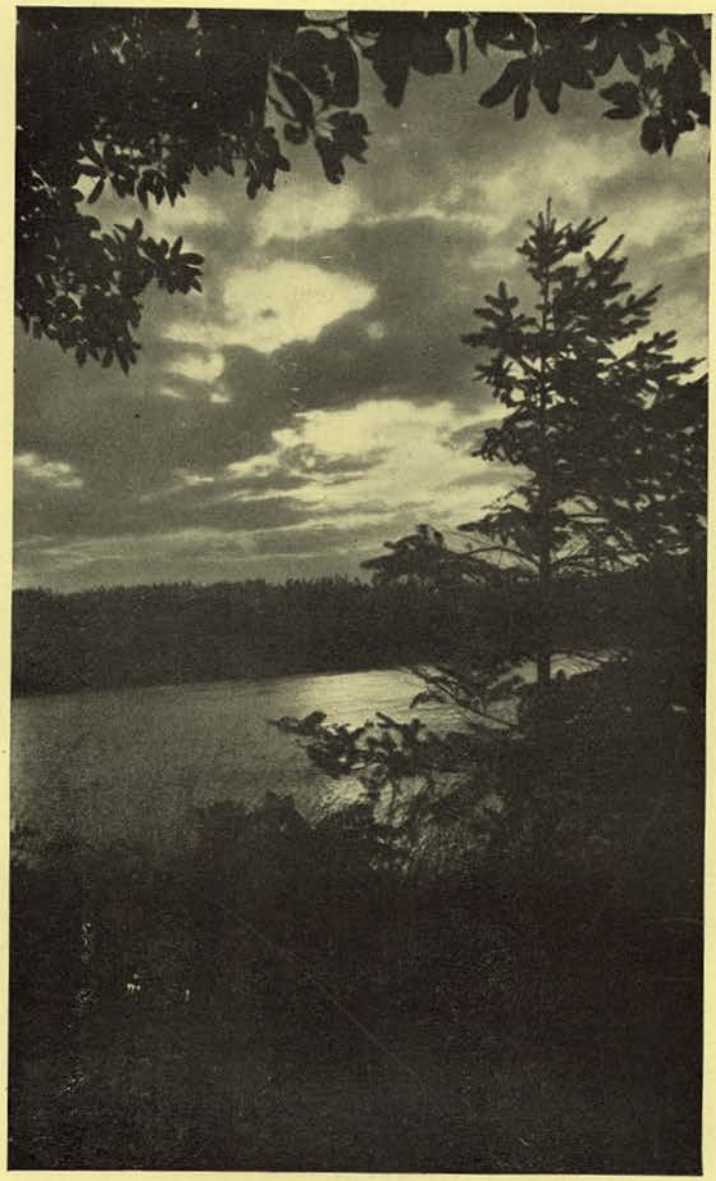


"Here We Have Idaho"



A Typical Moonlight Scene on an Idaho Lake

THE IDAHO FORESTER

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Dedication

In appreciation of his services to the cause of forestry in Idaho this edition of the Idaho Forester is gratefully dedicated to

Charles K. McHarg, Jr.

WHERE DO WE GO FROM HERE

CHARLES K. MCHARG, JR.
Regional Forest Inspector, Region One

In 1925 Idaho adopted her existing Forestry Law. Its well known and outstanding provisions are: a Cooperative Board of Forestry on which the ex-officio members are in the majority but which is otherwise truly representative; a State Forester reasonably well protected from politics; the requirement that forest fire control extend to all forest land or so called "compulsory patrol"; and adequate slash disposal. In 1929 a companion measure, the Reforestation Law, was added to the forest laws of the State to stimulate the extension of forest management to all forest land, through the incentive of a low assessed valuation and yield tax, applicable to lands dedicated by the owner to timber production and watershed protection, and upon meeting the obligation of permanent and adequate forest fire control.

Prior to these Acts, that is during the period from 1906 to 1925, cooperative forest fire control was born and progressively developed from plausible experiment into a necessary and effective procedure. Its conception is credited to a small group of lumbermen, both operating and non-operating owners of white pine timber lands within the Coeur d'Alene waters, who decided to work together for mutual benefit in guarding themselves against losses periodically threatened by forest fires. Logically, the State of Idaho, through its State Board of Land Commissioners, and the Federal Government, through its Department of Agriculture, Forest Service, as proprietors of timber holdings and lands chiefly valuable for watershed protection and timber production, entered into a relationship with the organized private owners, the State directly as a member under the authorization of the Fallon Fire Law, and the Federal Government as an interested but outside cooperator. Federal cooperation was extended to a closer relationship, though still in a small way, by the enactment of the Weeks Law of 1911 and limited funds became available from this Act to aid the State in protecting the low valued lands at "the headwaters of navigable streams". Again, the limitations of the Weeks Law rendering it somewhat obsolete, and following comprehensive nation wide studies by the U. S. Chamber of Commerce and the Select Senate Committee on Forestry, the Federal Government adopted the Clarke-McNary Act, which, applied to Idaho, permitted actual participation on a larger scale in the State's fire control activities.

The combined experience of all agencies in the State during these years established fundamental facts, proven to the many though not even yet wholly acceptable to the few, cognizance of which is essential to, if not the essence of forest land management in Idaho.

First: all forest land, that is, all land bearing inflammable forest cover of any kind or size, must be protected. Forest land in Idaho is not broken up by natural barriers and interspersed with extensive cultivated tracts, but is almost one continuous expanse through which forest fires have burned from late spring until fall and have traveled fifty miles or more. Witness townships and large drainages of even aged stands of timber established following the fires before the days of the white man and lumbering.

Second: slash created by logging and clearing which, if undisposed of or if disposed of by the broad cast burn, constitutes a hazard inimical to fire control. True, that individual tracts with slash on them compared to the aggregate area of slash left and subsequently burned by forest fires within a few years, is probably as one is to fifty. The Forest Service and some enlightened operators, early committed to a policy of slash disposal by piling and then burning safely within the area of the slash pile, have good reason to be thankful for the more than compensating benefits received.

Third: the cost of adequate fire control is high, and more difficult and more expensive on cut over and burned over land than in green timber, but the sum of patrol costs plus firefighting cost plus losses may be reduced by spending effectively more money in the establishment and maintenance of an adequate patrol. It has been proven beyond question that an effectively trained, well equipped and numerically sufficient guard force saves its cost and shows a profit in reduced fire suppression expense and reduced losses.

At this writing, 1931, Idaho has seen 25 years of cooperative fire control, 19 years of strictly voluntary cooperation and 6 years of combined voluntary and enforced cooperation. During the first period performance exceeded the requirements of law. During the last and shorter period the requirements of law, reflecting more advanced thought and information, caught up with and passed the average of performance. We have grown apace, we are judging by higher standards and we have standards and experience to judge by.

There is opposition to the present order. A de-

termined effort has been made in our 1931 Legislature to go back to the old ways through a repeal of the 1925 statute and the substitution of a near replica of the Fallon Fire Law. This antagonism, which prevents an orderly progression in legislation, indicates either failure of the Forestry Law in part to meet conditions, failure in its administration, or failure of some interests to accept the obligations of ownership as expressed by law. This is a challenge to the progressive and competent agencies to use the next two years in determining the basic reasons for the existing antipathies, in correcting the difficulties as far as at present authorized in administration, in awakening public interest by correct and complete information and in arriving at a definite agreement on necessary improvements in legislation.

It can not be expected that any legislative act, regardless of how well constructed, or how comprehensively expressive of good judgment and foresight, will continue in its unchanged, original form year after year, when the objects of its controlling influence are undergoing continuous change by their very nature. The ratio of cutover and burned over land to the total of all forest land is shifting; young growth lands of twenty five years ago are approaching merchantability; utilization requirements are varying from year to year; the proportion of ownership in large holdings is being lowered; the expense of fire control for given units is affected by development; in fact, the problems of forest land proprietorship, as affected by law are in a state of flux.

It should be apparent that to meet such continuous change the governing laws should be subject to progressive amendment as the need arises but they must be protected from the purely individual, selfish interest and the whims of an unenlightened and ill-informed minority. Agencies already existing, namely, the Idaho State Chamber of Commerce, the North Idaho Forestry Association, and the State Cooperative Board of Forestry have the technical knowledge, the Public Spirit and adequate strength to keep Idaho's forest laws equitable, effective and abreast of the times.

The corrective efforts of these agencies, responsible by reason of self imposed or legally authorized obligations, should be centered on a determination of the needs and the means for meeting them, bearing in mind that honest opposition and mis-information must be overcome by demonstration of the fundamentals already mentioned.

First, it is apparent that all forest land chiefly valuable for timber production and watershed protection must receive adequate and permanent protection. The "compulsory patrol", or in the words of the Statute, "Every owner of forest lands in the State shall furnish or provide therefor, throughout the closed season, protection against the starting, existence or spread of fire thereon, or therefrom——", has proved to be somewhat unpopular and has not brought all forest lands under protection. It must, therefore, be considered as an expedient measure, effective until something better can be developed. It is a legally expressed obligation of ownership just as the payment of taxes is an obligation of ownership. For the most part large corporate owners fulfill this obligation on a more or less permanent basis. But individual owners are not inclined to be sympathetic toward additional costs. What if the actual value of the land, based on current returns or reasonably certain returns in the near future, is so low that taxes alone or taxes and protection cost will, in a few years, equal its value? What if there are no current returns and no hope of returns for many years as in the case of denuded land? Should consideration be given to the fact that many a present owner acquired merchantable timber land at low cost, held it for a few years with no cost other than taxes, and then sold the timber at a good profit? Granting for the moment that it is an uneconomic condition under which the cost of ownership exceeds in a short period the actual value, it should be remembered that many tracts now in individual ownership would show investment possibilities including all carrying charges if the whole cycle from yield to yield, over a period of say 50 years, were taken into account.

Much sympathy has been forthcoming for the owner of forest land who, after collecting the profits from the sale of timber, now finds himself facing the carrying charges entailed by an assessed valuation of possibly $5.00 per acre and protection charges of 6 cents per acre per year applied to a quarter section of broadcast burned land which will be a hazard for many years to come. He is apt to let the land go to the County and wail, "Confiscation". However, we can not expect of him enough altruism to hold his land for the good of posterity alone, without the definite promise of low cost or near future returns or both. Regardless of how we feel about his responsibilities, if we want him to hold his land we will have to do something about it but it cannot be conceded that the compulsory patrol costs will occasion delinquency. They may be the "last straw" but taxes alone on cutover and burned over land are sufficient to cause and have caused transfer of title to the Counties.

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NATURAL AND HUMAN FORCES IN FIRE CONTROL

MAJOR EVAN W. KELLEY,
Regional Forester, Region One, Missoula

That fire during the past 25 years has wrought havoc to the potential production of wood in the national forests and elsewhere in the eastern half of the Inland Empire is a matter of common knowledge. Throughout this period, ways and means of restricting fire toll upon capital and increment have engaged more attention of foresters than all other phases of forest management combined. Yet it cannot be said that the upper hand has been won. At intervals, have come the "bad years" so-called, during which the percentage of damage added to that which already has occurred widens the breach between sustained yield and sustained losses to an extent that can be altogether discouraging if one permits himself to become discouraged by past occurrences without searching for the underlying reasons. Even superficial search for facts in this field clearly indicates that much of the loss is chargeable to preventable human failure.

The term "failure" is used advisedly. Every fire that starts from a preventable cause is the fruit of the weakness of those responsible for the development and passage of potent fire prevention laws, effective educational methods, timely and vigorous law enforcement methods, methods insuring safety of fire-using machinery and safety of practices in slash disposal and refuse-burning of all kinds.

It is failure when a fire grows into a conflagration if the reasons therefor are traceable to causes which are well within the reach of the public or responsible organization or individual to prevent.

For instance, it is the public's failure if a fire grows large for reason of long-elapsed attack time traceable to lack of detection facilities long recognized as needed and justified and long advocated but for which the board of directors, the Congress, fails to provide funds. It is organization failure if the resources made available by the board of directors are not expended with due regard to the relative urgency and importance of the wide range of needs that clamor for attention.

It is individual failure if a lookout does not discover promptly a fire at 3 p. m. because he was off his tower even for a short period during critical afternoon hours.

In the Northwest, 1910 appears as the index year of organized fire control effort. What happened that year needs no description. The failures of 1910 are largely traceable to the fact that the American people had failed to awaken to the danger of forest fires, despite the lessons of such previous disasters as those in Maine and Michigan and other Lake States. The meager organizations of 1910 in the field had not been provided with essential facilities, adequate supervision or training. As a result, undoubtedly, failures were multiple,—public, organization, individual.

Nine years elapsed. Another so-called "bad year"—fell upon the Inland Empire. Although much progress had been made in the interim, yet the organizations were still pitifully unprepared with vitally needed facilities. During the war period, developments came to a standstill and perhaps some retrogradations had occurred. Post war labor was at a low ebb of productivity; many lumbering operators had yet not heeded the warnings of past singeings. Thousands of acres of unburned slash awaited the exploding sparks from an improperly guarded locomotive or donkey stack. True to tradition, sparks fell. Railroad companies were still setting fire to the very resource which encouraged them to enter the territory. State fire control laws had not been provided to present-day strength. The public had continued to fail to see and to act. Then too, during the interim, were instances of budgeting which likley would fail to withstand a priority test designed under present day conceptions to determine whether the available dollars in due proportion had been expended for fire control needs of keenest import. Then, too, again retrospectively, many other kinds of failure loom up, all combined to record another holocaust in the annals of fire control in the Northwest.

A lull, comparatively speaking, in acute fire danger occurred until 1926. Then another critical year struck. Likely it was unique in the history of the present timber rotation. Clearer than any other, this year records that the fire load on the heavy lightning smitten areas was so extraordinarily large and concentrated that despite all human effort within reach on short notice, losses above average were unavoidable. But again retrospectively, the analysts of executive management now see practical ways to have strengthened action and to have greatly reduced burned acreage.

The next critical season, 1929, hit with tremendous force. Old timers assert that the inflammability was the highest ever experienced; however lightning concentration was less severe than in 1926.

As the physical plant more nearly approaches completion, the sorting of organization and individual failures from those due to lack of needed facilities is rapidly becoming less difficult; therefore underlying causes of the large losses of 1929 are clearly determinable. In bygone years, failures of appropriating bodies, public failures, perpetuated conditions which inextricably confused action and inaction of organizations and individuals with failures due to plant deficiencies. Accordingly to put fingers on the causes of many failures often was impossible. Executive management now is far less handicapt. It can trace action on fires with a convincing degree of accuracy and with illuminating results. No higher office can be performed in fire control than for executive management to search out and eliminate reasons behind the reasons for failures, just as competent executive management hits at reasons for poor lumber and high costs in a sawmilling operation and promptly acts to remove the source of trouble.

True to history, the prevention of the major part of 1929 losses was well within the reach of the public, organization and individual effort.

Two of the most damaging and costly fires of 1929 were traceable directly to neglect of slash disposal on logging areas and to the unexplainable public tolerance toward this self registering risk and one which times without number has overwhelmed the northwest and has stolen so much of its heritage. A third was due to the failure of a contemporary organization. Combination of failures explain the underlying reasons for certain other losses of 1929. Embarrassing deficiencies in concepts and organization and individual planning and action enter, and this notwithstanding the many splendid achievements of the year.

Another line about 1910 and 1919. Except that their fire records are interesting historically and a blight upon the history of forestry in the United States, in view of present day developments, in my thought, they had better be forgotten lest the tremendous losses of those two years come to be accepted at their face value of evidence of the futility of fire control in this corner of the United States.

If this is sound, what of the records of 1926 and 1929? When these are analyzed, case by case, as before indicated, all is not gloomy. The 1926 experience, despite of all the splendid action taken, shows the need for more speed in mobilization of large bodies of first line "firegetters" and follow-up from all available sources.

It shows too, the futility of the Forest Service or any other organization hoping to build up an independent overhead force or a force of fire guards sufficient to cope with such a concentration of lightning fires. Such an eventuality is in fact a regional calamity requiring the immediate pooling of all fighting resources and the services of every able bodied worker and leader who can be delivered quickly to the scenes of action with adequate follow-up within 12 hours as the extreme limit.

This calls for large scale advanced planning covering mobilizatoin from points within a radius of say 200 miles, all available forest officers, employees of lumber companies, highway workers, local settlers and aid from other organized and unorganized sources of help. Comparable plans for transportation and intelligent use of large volunteer forces are a part of the scheme that executive management must work out and keep alive. Modern transportation means have greatly shrunken the obstacle of distance to mobilization. This revolution in speedy travel has come so rapidly that its contributions to fire control is likely to be partially overlooked.

The experiences of 1926 also show the inescapable need for speeding construction of held fire line. The practicability of executive management accomplishing great strides in this master item of fire control looms large. Lastly the lessons of that year require continuing the standards of generalship, and executive management at many points in the organization comparable with that obtaining in the best organized and managed industries. This is vital to success. Fire control from prevention to suppression is doomed to fail unless executive management redeems its responsibility.

The failures of 1929 give fresh and clearer emphasis to all the lessons of 1926 with new teachings added. As clean-cut as a Greek profile is the proved need for speeding up control action. An astonishingly large number of fires, 50 per cent or thereabouts, are not discovered within 12 hours following inception; out of poor detection grows indecision of location when the smoke eventually is sighted; its fruit in turn is the delayed dispatching of forces until doubts are resolved to some indescribable degree; a fireman dispatched with lack of confidence in reported location, travels under the influence of weakened morale; he loses time in searching for fires that may be in "X" Creek, or on the other hand, over on Ox Gulch; he arrives at the fire too often low in enthusiasm and fagged after a long, hard tramp and search under heavy pack on rough

topography. At best under such conditions, only the attack of a tired man can be staged on a fire that may have been burning often as long as 24 hours. The best effort the man has left is usually given but it is not enough. The fire gets away. A class "C" fire results.

Speeding up detection is definitely under way and in a big way. Compared with 1929, more than 150 additional lookouts will be manned in 1931. The manpower for this intensification is obtained largely from places where two or more men have been stationed previously, and from positions previously located as "blind" camps at lower elevations.

Studies prove that certain lookouts at highest elevations have given poor service. Many have been shifted to lower peaks within the heart of proved danger zones. Being closer to seats of trouble means speedier attack when a fire occurs.

Many of these changes are made possible by Congress recognizing the need for increased improvement funds, and funds received, by the man on the ground following the inflexible rule that the great bulk of the appropriation shall be invested in such manner as to insure the greatest possible contribution to speed. Accordingly, improvement funds go into telephone lines, extensions and additional lookout houses, trails and simple roads. A feature of the change is a drift from primary lookouts to that of the lookout-fireman type. In the latter, the man discovers his fire or fires, locates, reports and suppresses them.

As explained, this system provides that the majority of fire guards become their own lookouts. Each man overlooks a relatively small area. He can know its topography intimately. Short views give added insurance of earlier discovery and fewer "hangovers". He sees his fire before starting. He travels shorter distances on the average than of old. He travels at better speed and in higher spirits because of his confidence in knowing where his fire is located. In light of his intimate knowledge of his fire unit, he arrives by the shortest feasible route and under a lighter pack in fighting trim to kill his fire within the sought-for goal, the class "A" stage. In many instances, shortly he will be joined by a second fireman from a neighboring lookout or by trail workers dispatched post-haste to that known spot.

Looking into the past again: a large percentage of fires were not discovered before burning to crew size. Some such fires but far fewer are to be expected in the future. Others may continue to escape the fireman's efforts and burst to crew size. A crew is needed and quickly. In this phase of fire control, analysis of past action reveals the crying need for greater speed in placing crews of proper strength on the job. Well supervised forces large enough to corral and mop up each fire to point of safety before noon of the following day at the latest, are essential.

How big a crew? So often has it been said: "Send 10 men. I have a 5-acre fire". Therein the trouble starts. Lack of executive skill and planning at the jump-off. Why? In the first place, fire fighting is not a job whose size varies directly with varying acreage; instead, it varies in direct proportion to the length of the perimeter to be worked in given fuel types and mopped up to a point of safety within the first work period, or if that is past, in some other specific upset time. The first step then, in good executive planning is to calculate probabilities and length of line involved, taking weather influences into consideration. With the output of held line per hour including a safety factor for a single worker analytically estimated, to figure the number of man-hours of labor needed is simple. From that factor the crew strength required can readily be deduced. To calculate the size of a fire suppression job in this manner gives it tangibility. It points out a task whose elements are subject to weighing exactly as are those of a road construction project or the building of the Hoover Dam. It is taken out of the obscure, fuzzy, got-a-big-fire, lack of systematic thinking plane and made a problem to be dealt with as a competent engineer and executive deals planwise with innumerable other matters requiring systematic approach. The output of held line per man-hour factor has been worked out for all major fuel types.

The review indicates many opportunities for greater speed in delivery of guards and other fire fighters to fires. Further analyzing current practices as a feature of executive management, brings to light ways and means of lightening the firegetter pack. It has been reduced from 38 and 42 pounds standard to 24 pounds. Going a step farther in this inquiry, ways are found to cut many hundred weights from the standard 25-man outfit. Still speedier crew delivery is promised by providing "sapper units" weighing about 25 pounds with ration, which in the absence of pack animals, crews will shoulder without delay, march to scenes of battle and hit night or day with the intention of holding the fire within the "B" or smaller unit of the "C" stage, and mopping it up clean within one work period. Under delays in-

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RANGE MANAGEMENT AS A FIELD IN FORESTRY

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Forestry as originally conceived pertained chiefly to the management of forest lands for the purpose of growing timber. This "lily-white" conception of the profession has gradually given way to a much broader view. As the management of forest lands developed it became evident that forestry did not stop with the growing of timber and the utilization of wood but perforce must deal with all the resources of forest land and their wise use. Probably not a single tract of forest land in this country can be pointed to where the growing of timber is the sole objective in management that should be considered. One or more of (a) the influence of forests on climate, water, soil erosion, etc., (b) outdoor recreation, (c) wild life resources, (d) utilization of the forage crop, and (e) miscellaneous by-products, also should receive full consideration. Obviously the forester should know the art of managing the land for the production, utilization, conservation and protection of all of these resources.

Important among these coordinate resources on a large proportion of the forest land is the forage crop. It behooves the forester to know for such lands how, when, and under what conditions the forage crop can be utilized. The hoped for ideal may be ultimately to have every acre of present or potential commercial forest land so producing timber that the growing and harvesting of a forage crop on a sound economical basis will be excluded from consideration. That, however, for extensive areas of land is a standard of excellence not to be realized in many generations; in the meantime there is the present situation to be met.

Of the 138 million acres of federal land inside the National Forests, exclusive of Alaska, some 83 million acres or about 60 per cent of the total area is used for grazing purposes. Of the area grazed, approximately 21 million acres may be classed as open grass land, 42 million acres as more or less open timber land and the balance, or 20 million acres, is woodland type, brush, burns, etc. For the five-year period 1924-1928, inclusive, there was grazed on this range annually an average of 1,479,843 cattle, 6,311,426 sheep, 19,929 goats, 756,227 horses, and 1,145 swine exclusive of animals under six months of age, under paid permit and 90,236 animals under free use privileges. Much, although not all, of the private and state owned forest land in the United States also is used for grazing. Afforestation and reforestation will ultimately claim more or less of the area now grazed, but much of it will continue indefinitely to be used for grazing if properly managed.

For various reasons it is the duty of the forester to be qualified to manage grazing. Merely to exclude grazing from all forest lands would not be an intelligent course to pursue. It is common sense that the commercial value of the forage should be realized upon wherever grazing can be practiced so as not to interfere with more important uses. Utilization of the forage crop is often a crutch upon which timber growing can lean during more or less of the regrowth period. To eliminate grazing under such circumstances would be so adverse economically as to place timber growing under a still more difficult financial strain.

The forester should not be content to depend upon the expert trained solely in the art of range management to be entirely responsible for the handling of grazing on forest lands. To do so might result in other than the best outcome in the growing of the timber crop. Although the proper use of the forage crop in itself is important, it is important first of all that the grazing be done in a manner that will not endanger the timber crop. The range expert should be, first of all, a forester wherever forest values are involved, in order that he will be equipped not only properly to manage the forage resource but to correlate this use with the growing of timber.

The sciences of forestry and range management basically are closely related to each other. Timber and range forage are both products of uncultivated or wild lands and of similar soils and climate. The same fundamental sciences of plant growth are involved in each. Pure silviculture must recognize and take into consideration the plant cover other than timber. The range specialist also must deal with forest growth as part of the plant cover on grazing lands. The close associations in many ways leave no definite line of demarcation between silviculture and range management.

The prospects for the person who is choosing range management as the phase of forestry in which he expects to specialize are fairly encouraging. The field as a whole is but little developed. At present the chief demand is in the federal service, including the Forest Service, the Indian Service and the Biological Survey and in educational institutions. Range management as yet has not been applied extensively on state and private forest lands but the need is apparent and will event-

ually be met. Only a few students who have specialized in the range management have obtained employment with private range interests, but this field may be expected to grow.

The tendency in the Forest Service has been to absorb men who have specialized in range management into higher positions on approximately an equal basis with those who have specialized in silviculture or forest management. The usual practice is to assign some of the candidates who enter the Service from the Junior Range Examiner Civil Service eligible lists to range survey or other special grazing work. A few of these work into higher special positions in range management, while others are gradually absorbed into the higher general administrative work on the National Forests. The practice is much the same as that with men who enter from the Junior Forester list and first start on timber sale, timber survey or other special work in silviculture. Originally there was a tendency to suppose that once a grazing specialist always a grazing specialist without much opportunity for advancement. The need for men with good training in grazing work in many forest supervisor and other more important positions, however, is definite proof of the fallacy of the prophecy of the former head of a former forest school who once told some of his students that the person who specialized in grazing would never advance any farther than a subordinate position on the administrative staff of a National Forest.

The gradual rise in the importance of the forest ranger position in the Forest Service and the more extensive drawing from the eligible lists from the technical examinations to fill range positions has opened another field for candidates who specialize in range management. At least an equal proportion of men have been drawn for ranger assignments from both the Junior Range Examiner and the Junior Forester list. The ranger experience is considered to be very valuable training for higher positions both in administrative work and research.

A few men are being selected each year from among candidates trained in range management for range research work in the Forest Service. There will continue to be considerable demand for men with range management training in research, many of whom will be selected from men who have had experience in administrative work of one kind or another. Range management training also is a useful background for the forest ecologist.

Sooner or later Congress will finally take action that will result in the more intelligent management of the remaining open public domain. When that time comes there will be a real job for men versed in the science of range management to rehabilitate and maintain the productivity of these grazing areas, regardless of where the administration of the land is placed.

Educational institutions and state and private research organizations will continue to engage a few additional forester-range specialists. No less than nine institutions employ such men at the present time. A few more institutions will undertake such work as the need develops. Unfortunately range management has not received the recognition it deserves in agricultural extension work. Sooner or later however, this need will be recognized and a new field for the grazing specialists will be opened.

The range industry itself will gradually take more men trained in range management than it has in the past. The need, while apparent, as yet is not very generally recognized. During the past fifty to eighty years, the period of occupation of western range lands, the grazier has had the advantage of the fertility of the soil which is the result of the accumulation of centuries of weathering of earth materials and the decay of vegetation. Indiscriminate use of extensive areas has robbed the land of much of its plant cover with subsequent erosion and removal of the most productive layer of the soil. It will be necessary to arrest this destructive process and turn the tables in favor of rehabilitation; otherwise the range industry will pass out and leave only the ruins of uncontrolled surface run-off and erosion probably with the greatest damage done to the water supply and to adjacent lands upon which the eroded materials will be deposited. The process of rehabilitation will require the services of the expert who will be qualified to develop sound practices from the standpoint of both range conservation and profitable business enterprise.

It is not within the scope of this paper to discuss the merits of mass production. However, if range livestock production is placed on an "efficiency" basis as has been done with manufacturing and is being done in many respects with farming, the range expert will be a necessary part of the scheme.

Naturally the range livestock industry will be more directly interested in the animal production phase of grazing. It will desire agents who are trained in animal husbandry as well as in range management with less thought, perhaps, of the forestry side unless more or less of the range in-

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INDUSTRIAL FORESTRY

W. S. ROSENBERRY
General Manager, Winton Lumber Company, Gibbs, Idaho

The first national forestry act in this country was the Timber Culture Act of 1873. Prior to this time, different forestry bills had been introduced in Congress, one of the earliest of these being a bill "American Forest Tree Propagation and Land Company" introduced by Senator Brown of Missouri in 1866, but the Timber Culture Act of 1873 was the first bill to become a law and I think should be classed as the first conservation measure passed by Congress. On account of the impracticability of this law, even as later amended, it really had no effect on the federal forestry program, and it was not until the act of March 3, 1891, repealing the Timber Culture Act and giving the President of the United States the power to set apart, and reserve by proclamation, in any state or territory having public forest lands, public reservations, became a law, that anything really constructive was done along the line of a federal forestry policy. Under this law President Harrison created fifteen forest reserves embracing an area of over 13,000,000 acres. Some of these reserves were not set aside because of the timber value, but for national park purposes. On February 22nd, 1897 President Cleveland by proclamation created 13 new reserves embracing 21,000,000 acres. The forestry laws were further amended by the act of June 4, 1897. McKinley became President March 4th, 1897, and during his administration the number of forest reserves was increased from 28 to 40 and in 1901 they covered a total area of 50,000,000 acres. President Roosevelt, during his administration, urged on by the most ardent forester of our time, Gifford Pinchot, increased the reserves so that in 1907 we had 159 distinct reserves embracing an area of 150,000,000 acres. June 30, 1930, the net area of all the reserves was approximately 160,000,000 acres. These reserves are added to from time to time as different parcels are turned over to the government and, of course, there are some parcels that are still being taken from the government. In addition to the forest reserves, many states own large areas of forested and potential forest land, and the Department of the Interior is administering the cutting of timber on many Indian reservations that cover a total of a great many million acres. Only recently I read a statement that our forested lands in this country are at the present time almost equal to our agricultural lands, there being approximately 500,000,000 acres of each.

Nearly all of the early advocates of a forestry law were obsessed with the idea that the virgin forests of our country were soon to disappear. I well remember that during the early years of this century some of the best foresters of the time predicted that in from 25 to 50 years the country would be almost entirely stripped of its forests. We now know that these people had a very mistaken idea. Of course, many factors have entered into our national life to change the conditions that prevailed a quarter of a century ago, so it is not so strange that the prejudiced prediction of that time did not become a reality.

What we are concerned with here is industrial forestry and what it means, but I wanted to give you the above brief outline of our national and state forests so that you would have in mind that we are not going to be entirely dependent on industrial forestry for our future timber supply.

A number of definitions have been given of industrial forestry, and in fact, we require quite a number if all who profess to be practicing it are to come within their meaning, but for the purpose of this paper, let us give our own definition of industrial forestry as follows:

Industrial forestry is handling privately owned forested land, starting with the virgin crop, and managed by individuals or corporations, so that the same will produce a profitable and perpetual crop but not necessarily an annual crop.

Industrial forestry in our country is comparatively new. There are only a few individuals and corporations that have tried it out, and as a general proposition their experience is too limited at this time to say whether general industrial forestry can be practiced by individuals and corporations in a practical and profitable way.

In the November 8, 1930 American Lumberman, I read the story of William Walker of Greenwich Village, Massachusetts, who has developed a plan of industrial forestry that has worked out successfully on a small scale. His story in his own words I feel is worth repeating here.

"I was about 18 when I finished my schooling and went to work with my father in the mill. We farmed in summer and lumbered in winter. My father taught me the business. Our family didn't believe in cutting down trees just because there might be a demand for that sort of wood. We always cut to improve our timber land and then looked for a chance to sell the timber. If there happened to be a special call for some kind of

lumber and we didn't care to cut on our own land, we could usually buy stumpage from a nearby farmer.

"I inherited about 1,000 acres of timber land from my father, and I've bought a little and sold a little since then. During the 55 years I've been in the business we've cut about 400,000 feet of lumber a year, and by extra care in manufacturing got about the top retail price.

"I figure a good stand of white pine around here will grow about five hundred board feet a year, if land is cut over intelligently. You want to have about one good tree on each square rod of land. If the trees are thicker than that the growth is slower, so it pays to cut out the mature trees and the poor stuff. I always have marked the trees to be cut. If you go about it right, you can cut a lot of lumber on only 1,000 acres and then have more standing timber left a year later than you did when you started.

"When we bought that flat below School Hill over there," Mr. Walker went on, pointing to a beautifully wooded tract of white pine about a mile up the river from the bridge by his two mills, "it was white birch pasture land. That was 50 years ago. We cut out a few of the big white pines, and that paid for the land. Then I cut out the poplars and birch and weed trees and let the remaining white pines come along. The entire 40 acres were "weeded" and now there is a fine stand of white pine worth at least $3,000—big trees 18 to 24 inches at the butt. I've cut acres of birch in my time and let the small stuff rot on the ground. Just girdling a tree is usually enough and it will die. Of course, a lot of the weed trees can be cut for firewood. I've cut about 400,000 board feet a year of good lumber for a half-century and still have about 5,000,000 board feet of prime lumber on the original 1,000 acres of timber land. "Take School Hill over there, about 240 acres of as nice white pine land as you can find anywhere. I've been cutting there all my life, took out 800,000 board feet the last few years, and it's better now than ever. That hill is cheap at $21,500 today, it would cut a good 2,000,000 board feet of prime lumber if all the mature white pines were lumbered."

This is the best example of an individual practicing industrial forestry of which I have read.

We know of a few large companies that are practicing industrial forestry, but in every case I have learned of, their experience has been so limited that it could not be determined whether it was practical or profitable; but a number of companies are going ahead with an industrial forestry program. How many, if any, of them will be successful remains to be seen. Certainly no one can say that because an individual or corporation in one section of the country practices industrial forestry successfully, that it can be done in all sections of our country. Mr. Walker's results in Massachusetts probably could not be obtained at the present time in any of our western states.

As we are most concerned about Idaho, and I think from the standpoint of industrial forestry practiced by corporations rather than individuals, let us discuss this question briefly from the corporation's standpoint. We will assume that a corporation started in business in 1911 and made an investment in stumpage at that time. It is generally conceded that stumpage values in Idaho today are not very much higher than they were 20 years ago. This refers to the pines. Our mixed timber had no real value 20 years ago, and unless it is especially well located, it has no value today. In order to stress this point of investment, let me give you the history of a claim owned by our company purchased in 1911. We paid for the claim $12,000. It was estimated to have 3,600 M feet of Idaho white pine on it, or an average of $3.33 per M. Suppose we figured that we carried this claim to 1930, and then logged it. Figuring simple interest at 6%, in 1930 we would have an investment of $26,400, or $7.33 per M.

Our logging costs for 1930 were $14.00 per M and the average sales price of logs in Coeur d'Alene Lake for the year was $20.00 per M, leaving a stumpage return of $6.00 per M or a loss of $1.33 per M or $4788.00 after we carried the timber 20 years.

Dealing with averages, let us see what would happen to this same timber claim during the past 20 years. The average price for Idaho white pine logs as established by the Coeur d'Alene Log Owners Association for the exchange of logs among mills from 1911 to 1930 inclusive was $18.82 per M. The exchange price at all times was purposely high, but we will use the average of $18.82.

Our experience shows that our average logging cost for the 20 year period was $12.00 per M. This you will readily see would leave an average stumpage return of $6.82, or an actual loss of 51c per M, or in round numbers $1800.00 on the claim, as compared with a loss of $4788.00 if we had logged the claim in 1930.

We have not considered the protection cost nor the taxes. During the 20 year period the Coeur d'Alene Timber Protective Association protected this claim at an annual average cost of 14c per

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WHITE PINE PRODUCTION AND BLISTER RUST CONTROL

S. B. Detwiler

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This country can utilize many times the present output of white pine wood if it can be supplied cheaply enough. It is our best general purpose wood. Its light weight means low transportation costs in competition with wood of other species. The white pines are of rapid growth, easily managed, and are unusually well adapted to forest planting.

Until recent years the white pine marketed in the United States was northern white pine (*P. Strobus*), native to eastern North America. In the Tenth Census (1880) report on the forests of the United States, the map of Idaho shows a large area unexplored, the timber is estimated in cords, and western white pine is only casually mentioned. Little is said about sugar pine; economic discussion in the report deals mainly with northern white pine. Western white pine and sugar pine now constitute the bulk of the existing white pine supply.

Fragmentary and inadequate data on white pine in the United States in the past and present give a rough idea of the importance of these species in the future. When the Forest Survey is completed, facts will be available to deal adequately with this matter.

R. V. Reynolds of the Forest Service finds that in the United States from 1800 to 1925 inclusive the total cut of white pine was 451,000,000,000 feet B. M. of northern white pine and 12,200,000,000 feet of western white and sugar pine. White pine comprised 24 per cent of all the lumber cut during this 125 year period, and the average annual cut was 3,705,000 M. The cut of white pine in 1928 was 1,673,000 M. or 45 per cent of the average annual cut of the past 125 years.

In the Tenth Census, Sargent states that the average stand of northern white pine per acre over large areas would run about 10,000 feet, and Fernow gives a similar figure in his bulletin on white pine. On this basis, the estimated cut of *P. Strobus* since 1800 indicates that the area originally covered by stands of this species in the United States aggregated not less than 50 million acres, of which about 10 million acres still bear a good growth of *P. Strobus*. This assumption is probably below the mark for the reason that forest fires, fungi and insects probably destroyed as much or more white pine than the amount of growth of this species since 1800. Fernow* estimates "an area of not less than 400,000 square miles in the United States and the Dominion of Canada within which the white pine is in its home and surrounded by conditions of its own choice. A much larger territory than this is included within the limits of extreme distribution". He also states that the stand of northern white pine "aggregated not less than 700 billion feet of standing timber originally."

Much of the white pine land was cleared and farmed, but today a high percentage of these farms has reverted to forest or is lying idle. This is because white pine tends to occupy soils of high quality for coniferous forest growth but which are marginal for agricultural purposes. Probably not to exceed 20 million acres out of the original 50 million acres of white pine land are in use for purposes other than timber production. Deducting the 10 million acres still bearing white pine, it leaves 20 million acres that have been denuded of white pine, much of it poorly restocked with other species or entirely idle.

This unproductive land is principally responsible for the land problem of the Lake States, and these states have initiated constructive measures to rehabilitate this land through reforestation. Pennsylvania, New York and New England for some years have been meeting this problem effectively in the same way. The extensive abandonment of farms in New York since 1921, averaging about a quarter million acres annually (largely in the white pine region), has caused this state to undertake what is believed to be the most systematic and comprehensive state reforestation program in the United States.

Wherever forest planting is undertaken on a large scale, foresters are confronted with questions which are not met in managing forest stands of natural establishment. The species selected for planting must be well suited to commercial use, capable of building up depleted soils, and responsive to intensive management. Foresters have many lessons to learn, not only as to species, methods of planting, spacing and care, but also as to pedigreed seed, mixed planting and adaptation to the site.

Foresters here and abroad are learning that

*Bulletin No. 22, Division of Forestry, U. S. D. A.

Nature is the source of silvicultural wisdom. Nature had a basic reason for making the white pines the chief species over the greater portion of the best forest areas in North America. Whatever this reason may be, it appears logical to believe that Nature will continue to favor the white pines in competition with other forest species unless conditions are radically different from those existing in the past. Lumbering, burning, grazing and clearing have brought about changes, but the forest always has experienced these things in some degree. Our virgin forests also successfully combatted other destructive agencies, including indigenous insects and fungi.

The most radical change from virgin conditions which our American forest faces is the attack of new insect and fungous enemies introduced from other parts of the world. The chestnut blight, gypsy moth, larch canker, satin moth, blister rust, and the Dutch elm disease are forerunners of foreign invaders we shall have to combat in growing future forests of any species. The extent to which modern industry demands importation of plant products from all parts of the earth invites the eventual introduction of a great variety of new plant pests and the wider distribution of native ones. (The recent spread of Rocky Mountain spotted fever to Maryland and Virginia is an example of the latter process as it relates to man and his biological enemies). Forest management is becoming more and more concerned with protection from forest enemies of this character.

Just as public health measures safeguard our own lives, so must foresters contrive to safeguard the health of our forests. To do this requires knowledge, courage, and patient effort; too often the present attitude is careless or despairing. Intensive control measures adapted to farm and orchard crops cannot be considered in forestry, but a hopeful attitude toward this matter will lead to many measures that are simple, effective, and financially profitable.

The application of blister rust control to an area of eight million acres of white pine lands in the eastern United States is the most extensive achievement in forest disease control in any part of the world up to this time. It has been possible because of the exceptional value of white pine and because the control measures are simple and effective. The success of extensive blister rust control in the East, together with the progress which has been made in developing similar methods adapted to western forest conditions, gives us solid ground for the hope that control of the rust will prove to be practicable in the West. The inevitable difficulties, which all new developments must weather, are being overcome through the steadfast support of State officials, lumbermen and public-spirited citizens. This generous cooperation and the knowledge that western white pine is the foundation of economic welfare in the Inland Empire, furnish the incentive for the battle on the Western front.

The rust is known to be established at 15 centers of infected pine in Idaho, one center in eastern Washington and several in Oregon. Many other centers must be present in these regions and western Washington may be considered as generally infected. The rust is intensifying in Idaho with startling rapidity and must soon appear in California. To have been entirely effective, initial eradication of Ribes from the best white pine sites in Idaho should now be completed, and a good start made in California. There is still time to accomplish extensive control in Idaho, eastern Washington and western Montana, but the work must be done rapidly and well. Preliminary organization of the cooperative control forces has been perfected and the gravity of the situation is realized. Chemical warfare on Ribes offers a means of speeding up control work. Success or failure of control in the Inland Empire depends upon the rate at which Ribes are eradicated from the pine lands in the next five years. There are more than three million acres of white pine lands in this region representing three quarters of the value in a forest area half the size of the New England states.

Control of blister rust in white pine areas differs from control of many other pests because it does not require any treatment of the pines such as spraying or dusting or cutting out the diseased tree. It is comparable to the protection of grazing stock by the eradication of poisonous weeds. This disease cannot be communicated directly from pine to pine. Its attacks on pine come only as a result of development of a preliminary phase of the rust on currant or gooseberry bushes (Ribes). Without the aid of the Ribes bushes the rust is helpless to attack pines. Therefore, even though a pine stand might have become infected while those bushes were present, their thorough removal is an absolute prevention of additional pine infection.

Due to the very nature of blister rust control which involves the destruction of weed plants (Ribes) growing within and near the pine areas rather than a costly treatment of the pine crop,

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PROBLEMS IN WOOD CHEMISTRY

EDWIN C. JAHN
Associate Professor of Forestry, University of Idaho

The forester, although primarily concerned with the raising of repeated crops of timber, is necessarily vitally interested in the marketing and utilization of his forest crop. Until the past two decades the forest crop went into but few channels, leading to staple products of long standing use. By far the oldest and most important of these industries, the lumber industry, used wood in its original form. Other forest industries having an ancient and historical past are the charcoal and wood distillation industry, the production of certain tree oils and dyes, the naval stores industry, and of far more recent origin, the pulp and paper industry.

But within the past few years no forester can fail to have observed that an increasingly greater percentage of the forest crop has been transformed, largely by chemical means, into other products. The use of pulp has also been expanded to cover a variety of articles other than paper. The pulp and paper industry itself has grown to tremendous proportions. A few facts and figures may be cited to show the present importance of products other than lumber from cellulose and wood.

In 1930 there were about ten million tons of paper produced in the United States. In North America during 1930 over four million tons of newsprint paper were made as compared with 666,000 tons in 1899. Cellulose plastics have experienced very great growth in the past five years. In 1930 twenty million pounds of pyroxylin were manufactured. This was made into a variety of interesting products including phonograph records and safety glass. Other cellulose plastics are used in the production of molded goods, sensitized film, electric insulation, waterproof coatings, artificial hair, sausage casings, etc. Moisture sheeting (cellophane, etc.) was produced to the amount of 200,000,000 square yards in 1930, which is treble the production of 1927. Artificial silk or rayon manufacture amounted to 125 million pounds this past year. The past four years have witnessed the rise of what is already a great industry, namely the manufacture of wall and insulation fiber board. The Masonite Corporation alone turns out over 130 million square feet of board annually. Within the past year the new $1,500,000 plant of the Fir-Tex Corporation of St. Helens, Oregon, has been put into operation for the production of wall and insulation board from Douglas fir mill waste. It is possible to enumerate many other products from cellulose and wood which are of recent origin but these are sufficient to indicate that wood is an important raw material for several vital industries other than lumber manufacture. Our present knowledge of the chemistry of wood indicates that the future development of useful products from cellulose and wood may be even more impressive than heretofore. But more will be said of this consideration later.

At the present time wood does not furnish all the raw material for some of the products mentioned above. For example, cotton linters supply about 40% of the raw substance for rayon, although purified wood pulp is gaining in use at present. However, when the great amounts of wood waste available, as well as our stands of timber uneconomically suited for lumber, are considered, there is a potential raw material at hand not only sufficient to supply all of our present cellulosic industries but enough for a great expansion and development of new products in the future.

According to Forest Service statistics 76% of the total wood in the forest is wasted and but 24% converted into useful products. At the mill there is a 31% loss in edgings, slabs, shavings, sawdust, etc. Conversion of the lumber to the finished product accounts for another 20% loss based on the log. The woods waste varies, but in the heavy coast Douglas fir stands it amounts to 20% of the original stand, this figure including only sound timber of pulp log size or larger.

Furthermore there are the species which are not suited for lumber under the present economic conditions. The prime lumber species of Idaho is western white pine, yet it constitutes only 16% of the State's total timber stand, and but 26% of the stand in northern Idaho where the white pine belt is located. A large proportion of the remaining 84% of the State's timber yields low returns or is unprofitable to cut for lumber. Yet it can be considered a great potential raw material for products other than lumber.

Along with this glimpse of the "waste wood" and uneconomically suited lumber species which are at hand, there is a depressed lumber industry to be taken into consideration. The per capita consumption of lumber in the United States is apparently constantly on the decline. Lumber has met severe competition in construction, equipment, decoration, and even furniture. It has been predicted that the house of the future will be of aluminum and glass, and such a house was recently

exhibited in New York. But in its turn wood does, and will very likely to an even greater extent, compete with other materials, either as converted wood products or as specially treated lumber, artificial lumber, etc. The figures given in the first few paragraphs indicate the recent growth in use of certain wood and cellulose products.

The utilization of mill and woods waste as well as species whose economic value is low, is highly laudable and falls in line with national public sentiment and attention to by-product and waste utilization. But more to the point it is of direct practical and economic importance to the state. It is essential to increase our forest values by use of these potential raw materials and by extending the number of useful products obtained from wood. It is desirable that the lumber industry diversify or become co-ordinated with chemical wood-using industries. This would bring about a more complete utilization of the forest stand and mill waste and at the same time reduce operating and handling costs. Such a situation means a more stable industry, an impetus to forest management, permanent watersheds, and greatly increased forest values to the state and private owners.

It is the realization of these facts together with the recognition of the principle that such developments must be built upon and accompanied by research, that the Idaho School of Forestry expanded its research program by the addition of a wood chemistry laboratory. For the past several years the Forest Products Laboratory of the School under the direction of Dr. E. E. Hubert has been carrying on research in utilization and other lines. The new laboratory is a part of the Forest Products Laboratory.

Pure chemical research on wood is and will continue to lay the foundations for future forest industries, just as patient research over years has developed all of our great chemical industries based on natural resources such as the oils, coal tar, metals, etc. The chemical nature of wood is as yet but little understood, but with such fragmentary knowledge as is at our command we have built up the pulp, plastics, rayon, and other industries. It might also be stated as a rule that the knowledge of the chemical nature and structure of a substance not only enables us to know and utilize its uses, but leads to the production of numerous other substances. Therefore, it is only logical to assume that with the further elucidation of the nature of wood, new products and new industries will be created. It is impossible to predict what a comprehensive knowledge of the cellu-

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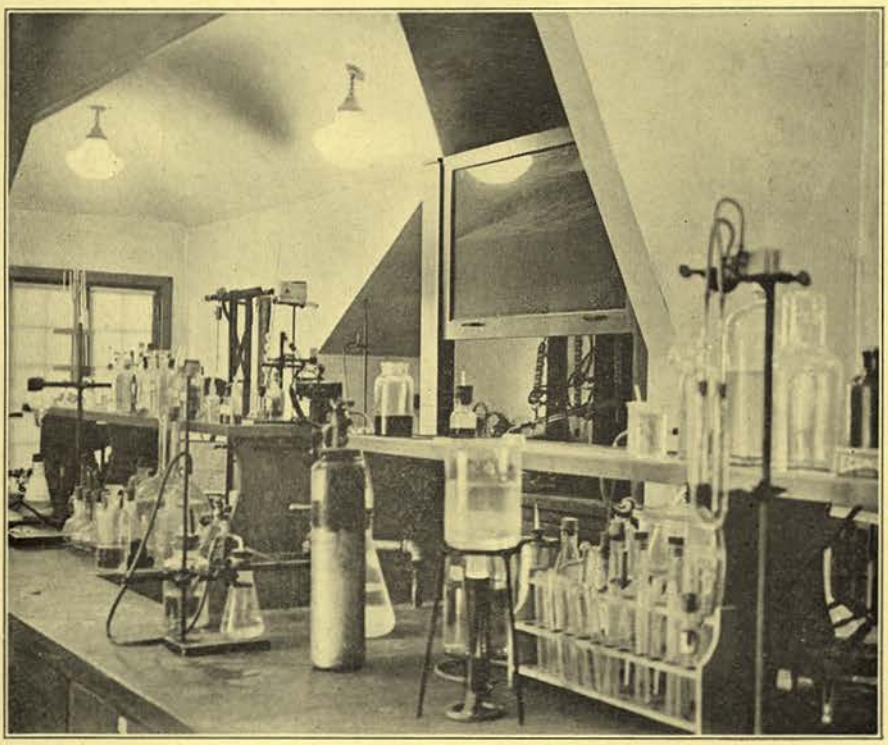
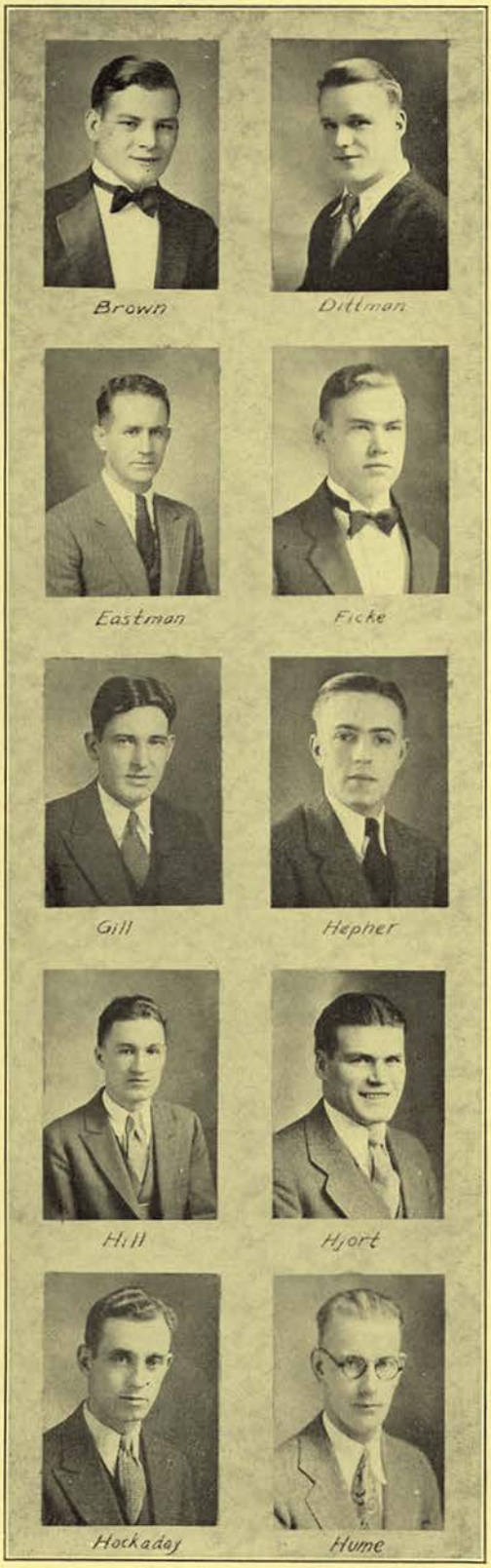


View In Wood Chemistry Laboratory



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"I" Club, Football 2, and 3.

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(Range Management)
Payette High School, Idaho

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University of Tennessee
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"I" Club, Football 2, and 4, Track 3.

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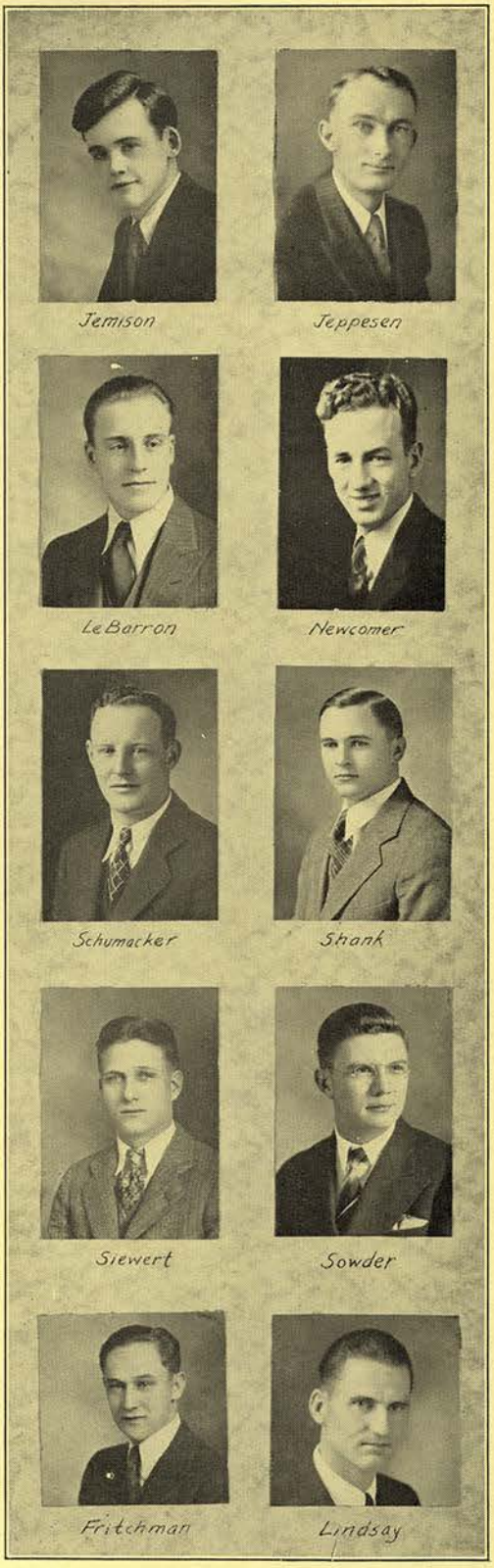


THE FOREST SURVEY

W. H. Bolles, '26
Assistant Forester, Pacific Northwest Forest Experiment Station

The need for an accurate picture of our forest resources has long been urgent but not until the passage of the McSweeney-McNary Act of 1928 did there appear to be any immediate prospect of undertaking such a study. Section 9 of this Act authorized a comprehensive survey of the present and prospective timber requirements, together with an inventory of the present timber supplies and such other facts as might be necessary to balance the timber budget of the United States.

The bill authorizes appropriations not to exceed a total of $3,000,000 or annual appropriations to the extent of $250,000 until the total authorization has been expended. Hence it will be impossible to consummate the work over the entire United States in less than twelve years without additional authority. However, each region will be completed as a unit in two or three years time and many of them will be covered long before the entire country is.

Scope of the Work

The forest survey is a fact-finding project designed to secure the first complete and accurate picture ever had of the forest situation and needs of the nation. It will determine:

1. The area of each type of forest cover, the stand of timber in board feet and cubic feet by species, and the regrowth conditions on cutover and burned forest land.
2. Rate of forest depletion by cutting, fire, insects, disease and any other important factors.
3. The rate of growth in existing forests and on reforesting areas, and probable future timber yields from the forest lands of the nation under present conditions of fire protection and forestry, also under adequate fire protection and systematic forest management.
4. Present national requirements in forest products and probable future trends in needs and character of use of forest products.

No such study on a comparable scale had previously been undertaken, hence the methods followed were, of necessity, developed from the very ground. To be sure some of our states, notably Michigan, also the Scandinavian countries have undertaken an economic survey of their forest resources and a study of their methods proved helpful, but conditions were so different that these techniques had to be modified and in many instances new techniques developed. The many ramifications became more apparent as the work progressed and it was necessary to alter or supplement the instructions until they were sufficiently comprehensive to cover all details of the work. It is believed that the general procedure along which the forest survey is conducted will be of interest to other members of the profession.

The forest survey was initiated in the Douglas fir region because of its large remaining stand of timber and its leadership in timber production. It is on the threshold of an area when from both the standpoint of the industry and the public, an inventory of the timber on hand, its rate of use and its growth will be of incalculable value in determining the proper course to steer. Work in the northwest is, for the present, confined to the Douglas fir region which is that part of Washington and Oregon between the Cascade Range and the Pacific Ocean. Later this work will be extended to the white and yellow pine forests of the Inland Empire. Work has already been started in the Lake States and in the Gulf States.

Sources of Information

The funds available for this study were not sufficient to permit any great area to be cruised, but a great deal of the information needed already existed in the files of the timber companies, commercial cruising firms, real estate brokers and various public offices. Obviously, cooperation was the key note to such an undertaking and the industry, encouraged to see their problems recognized by others, made a wholehearted response. Cruise data on timberlands are regarded with the zealousness of business secrets and this cooperation was a great demonstration of confidence in the work and aims of the forest survey.

A form was devised—the section assembly sheet—and the next several months were largely spent transcribing timber cruise data from the records of private owners. This form provided space for the data pertaining to one section, together with such other information as would enable the area to be identified. The volume of timber was segregated by species and by forties, or if the percentage of species was sufficiently uniform so that type was constant, only the section totals were copied. Any information which might assist in allocating the area into type or site classes was noted. These data are carefully preserved in locked files and will be made public only in such combinations with other ownerships as will safeguard its confidential character.

The county assessors were another source of helpful information. The assessor's office of every

county in the region was contacted at an early date and a record obtained of the area cruised by the county for tax purposes, also cut-over records to show the location of logged lands. In conjunction with these visits a category of timber owners and their addresses was compiled.

Other sources of information are cruises of State land, cruises of the revested Oregon and California land grant, Indian reservation cruises, national forest cruises, records of the state fire protective associations and aerial photographs.

Progress maps showing the area upon which data have been collected are kept up to date. Township plats are used and a color scheme designed to show the source and status of these data as satisfactory, estimate to be checked or cover type to be checked. Recent cutover, i. e., lands logged subsequent to January 1, 1920, are also shown on the progress map. Blank areas must be covered by field examination and are generally found to be agricultural land, deforested burn, or young growth of such size that it has no commercial value at this time.

Efficiency dictates that all existing data be assembled before field work is initiated. This enables the maximum of assistance to be obtained from office records and precludes unnecessary field work. Manifestly, data secured from existing records are obtained at considerably less cost than data taken in the field. Furthermore, the progress map enables the field examiner to plan his work efficiently since he can see just what areas must be covered.

Timber Types and Volumes

It was found that 38 cover types were required to provide adequate type classification for the Douglas fir region. These are divided into three groups: (1) non-forest types comprising the barren, cultivated and stump pasture areas, (2) woodland types for juniper and scrub oak, and (3) timberland types which also include the non-restocking cut-overs, recent cutovers and deforested burns. The classification by species was further subdivided on the basis of size. Thus Douglas fir was broken into five distinct types as follows: (A) mature over 40" d. b. h., (B) mature under 40" d. b. h., (C) immature 20"-40" d. b. h., (D) immature 6"-20" d. b. h., (E) reproduction. The age class by ten year intervals is shown for all stands less than 150 years old.

It is necessary that such a study reduce the timber estimates to a uniform and common standard of measure regardless of the source. Hence, the estimates as compiled in this survey are not necessarily the figures furnished by the cooperators, but are figures that have been adjusted and either supplemented or discounted to the predetermined standard. This checking is done by experienced men who are familiar with local cruising practice. The wood volume is determined in board feet and the cubic contents calculated by the use of conversion factors.

The standards of board-foot cruising adopted by the forest survey are to include all living trees of typical West Side conifers that measure 16" d. b. h., all typical East Side conifers that measure 12" d. b. h., and all living trees of the hardwood species recognized by the working plan that will make at least one 8-foot log 10" in diameter at the small end. All coniferous species are estimated to a 12" top where the tree is usable. Volumes are computed by the Scribner Decimal C rule, log scale basis with 40 feet as the maximum scaling length. Volume figures are presented in M feet B. M. Decay and other defects commonly allowed in cruising are deducted from the gross estimate. Trees are culled only when two-thirds of their gross scale is unmerchantable. Cedar is the only species of dead timber considered in volume computations. Poles, piling, shingle bolts and other special products large enough for saw logs are reduced to board feet by the use of converting factors.

Site

Site information is needed before the productive capacity of the region can be accurately predicted. It is also necessary when using yield tables to compute the volume of immature stands. There are five site qualities recognized in the Douglas fir region.

Site is best determined by the height at any given age and a limited number of such measurements are made by the field examiner. Although these site determinations are not sufficient in number to make a detailed site map for any particular township, they are probably sufficient to give a fairly accurate generalized site map for a county. One site determination per every four sections is regarded as the minimum which should be taken. These site determinations are plotted upon a map, a transparent paper superimposed and, guided by these points together with a knowledge of topographic and soil conditions, the site zones are sketched upon the overlay. The minimum site unit recognized is 640 acres.

Field Mapping

National Forest Lands

It was found convenient for the purpose of field work to divide the Douglas fir region into two

(Continued on page 46)

A COMPUTING HYPSOMETER PLATE FOR THE IMPROVED ABNEY LEVEL

GERHARD KEMPFF
Associate Professor of Forestry

In the fall and early winter of 1924 the resident forester of the federal experimental forest near Priest River, Idaho, was involved in a periodic measurement of a large number of tree heights. His job covered eight separate, trial thinning plots.

It is true, neither November nor December weather nor yet the second growth western white pine forest type in northern Idaho are conducive, as a rule, to rapid and enjoyable yet accurate height measurements. Both, weather and forest contribute to the work a jumble of features that are at times abundantly disagreeable: Water in double and triple molecular structure, freezing, aye subzero temperatures, wet and snow covered forest floor and underbrush, an almost one hundred per cent nonvisible average ground level at the stump, a broken terrain, and because of upper and nether leaf density, a difficult-to-locate point even at random distances from which may be projected a line of sight to both the tip of the tree and the corresponding breast height region. But if such natural factors must be contended with, and they sometimes become unavoidable in forest activity, a decided amelioration of scientific work sets in when the instrument and the method of performance perform efficiently. With apparatus and technic less capable, a real task attaches itself to the job and cannot be readily shaken. To this bitter work situation our forest officer humbled himself late that season.

Psychologically speaking, every humbling circumstance creates a reaction looking toward improvement. And from this well bubbled the desire to improve the instrument and the manner of measuring tree heights and of constructing the resultant curve. For hypsometric purposes of research there was in use then and on these plots the improved Forest Service Abney level fitted with a degree plate and mounted on a staff. It was considered as one of the more reliable hypsometers, and it has strengthened its worth since. The distance from tree to Abney was measured horizontally to the nearest foot—often quite inconveniently to say the least. But in the field, actual tree heights still remained a guess. For, this procedure anticipated the computation of heights as a distinct office phase of the job by the laborious method of tangents. The first step of improvement was taken after a particularly severe early December day. It was decided to compute individual heights by the simpler method of sines.[1] This method is applicable, of course, to any and all kinds of triangles and does not require a horizontal dimension. With real satisfaction distance determination was changed from the horizontal to the more rapid and accurate slope measurement. A few days later a preliminary alignment chart was conceived and it was constructed as soon as the field work was done. This chart, based on the newly adopted mode of calculation, speeded up office computation about tenfold over the original arithmetic tangent method. Shortly the use of the alignment chart led to the idea of incorporating right on the Abney level the necessary logarithmic scales by a reconstruction of the arc plate to a full circular plate and by introducing thereon a rotating ring-disk in simulation of circular slide rules.

The new plate was to have along the lower arc the customary degree graduations and upon the upper half of the circle and on the same side a scale of logarithmic sine magnitudes. These were to be identified by numbering them clockwise with the corresponding angle values from 10 to 90 degrees. The inner, rotatory disk was to be graduated with the logarithms of numbers. Both scales were to be the counterparts of the S (sine) and A scales found on an ordinary 10-inch polyphase linear slide rule.

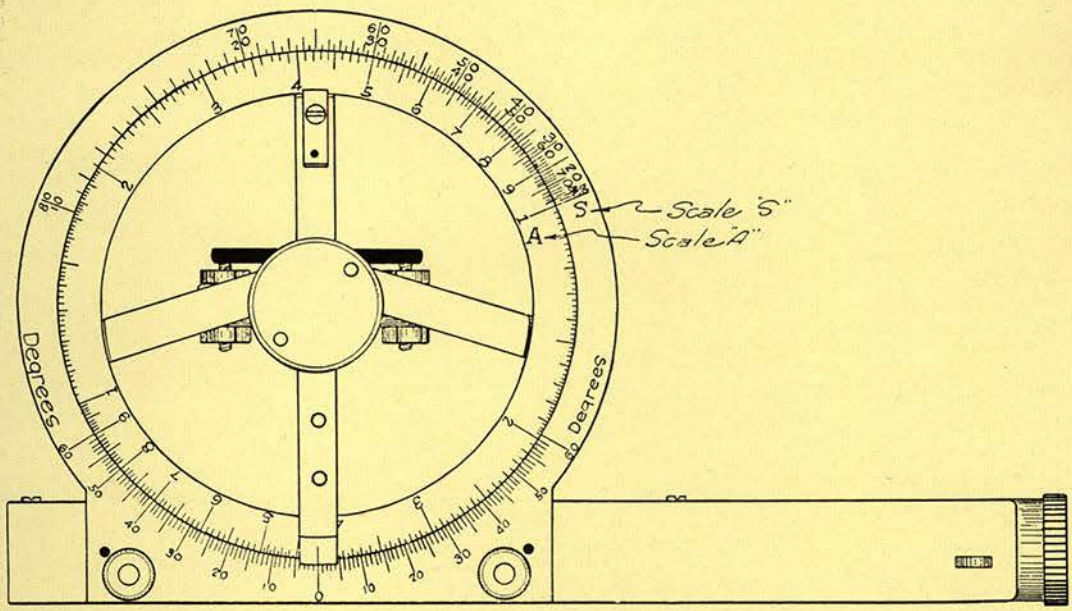
With this improved instrument our forester hoped to benefit further and that in a threefold manner tree height measurements made with the degree Abney level: 1. To know, to check and to record actual tree heights immediately and without added pieces of field equipment; 2. thus to eliminate all office computations without reduction of effective field time; 3. to eliminate guess work in the resultant curve by constructing it in the field under controllable conditions as to dispersion and scatter of individual heights.

So the birth of the new calendar year also witnessed the birth of a cardboard model, a blue print as it were, of the new hypsometer plate for the Abney level. However, other change-of-the-year duties were bearing down heavily and delayed the

[1]F. D. Mulholland of the British Columbia Forestry Branch refers to tree height measurements by the law of sines method thus: "We used this method as students at Edinburgh, carrying a 10-inch slide rule in the field." Journal of Forestry: February, 1926, page 218.

early completion of this rather easily made model. But while the pygmean month of the year was still young, the fibre plate attained full maturity and was photographed. By April 10 a handmade working model arose out of the aluminum covers of a tatum holder—not found in the property records. It was tested with full success that very spring.

The illustration below is a drawn reproduction of the first serviceable Abney Hypsometer Plate.



In elucidating further this now concreted idea, a few more things might be said.

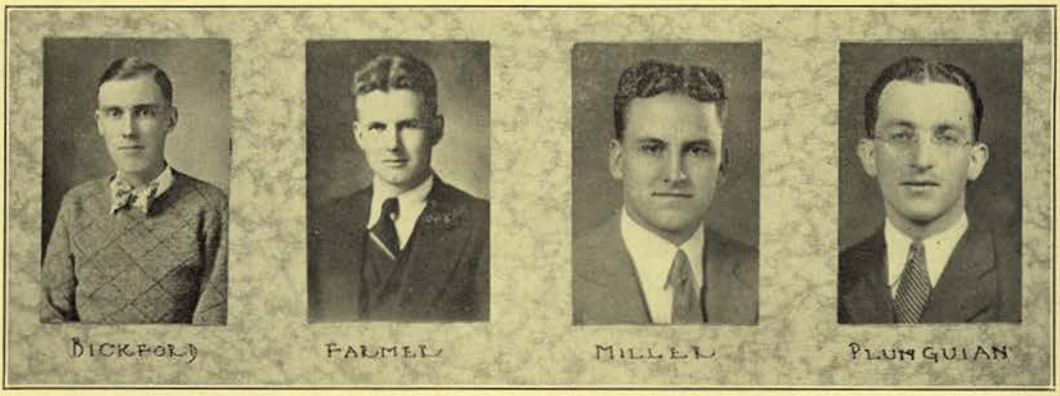
Given the distance from the king bolt of the Abney level to the average ground line of the tree or to any basal target, such as at five feet or the stump, given further the angle to the tip or to any desired point above the base, such as total log length or the base of the crown, as well as the angle to the basal target, the immediate determination of the height desired is, by the application of the law of sines, a simple matter of a *single* proportional setting on the unit plate-rule as it would be on any slide rule with similar scales.

The significant angle *near* the tip of the tree and opposite the leg represented by the slope distance is, of course, not read directly. It may be obtained by a subtraction of the angle *to* the tip—read off the plate—from 90. But this is not necessary. The cosine of the angle to the tip is identical to the sine of the desired angle near the tip. And as a concession to human frailty, the sine scale on the plate may also be made to show in red numbers and anti-clockwise for logarithmic cosine values the equivalent degrees from 0 to 80. As to the slope distance and the height of the tree, they may be read easily on the scale of the disk to the nearest unit of measure up to 500. The circumferencial length of this scale is equivalent to a similar scale placed on an 11-inch linear rule.

Ordinarily a temporary record need not be made of the three measures required to compute height and finish the proportion. The following procedure for two men has been found very helpful and efficient. From the point of observation determine first the angle to the tip and then the slope distance. Now set distance to cosine value of this angle (in red and anti-clockwise numbering). Then obtain the angle to the base. The procedure so far is constant for any observation point. If the two angles are of different signs add them. Under the sine value of this sum (black and clockwise numbering) read the height directly. If the angles to the tip and to the base are of like signs, as will occur if the observer is either above the tip or below the base level of the tree, subtract the smaller value from the larger to obtain the subtended angle. Read the height under this residual angle on the sine scale. With little practice such orderly procedure will permit one to determine heights with but slight chances for error and that in less time than was formerly required to record angle and slope distance readings with greater chances for error unless checked constantly. Moreover, immediate plotting of height on cross-section paper requires only a moment,

(Continued on page 54)

GRADUATE STUDENTS



ALLEN C. BICKFORD,

Gorham High School, N. H.
Dartmouth College, B.S., 1925

Mr. Bickford has been conducting some fundamental research on the oils and resins of Alpine Fir. The title of his thesis is "The Oleoresin of Alpine Fir (*Abies lasciocarpa*), Its Properties, Constituents, and Possible Uses."

LOWELL J. FARMER,

Canton High School, Minnesota
University of Minnesota (3 *Years*)
University of Idaho, B.S. (*For.*) 1930

Mr. Farmer has made a very interesting study of the insect history of trees after they are injured by fire. The title of his thesis is "Studies of Insects in Fire Injured Western Yellow Pine (*Pinus Ponderosa* Laws)." Mr. Farmer will be employed this summer by the Bureau of Entomology in and near Yellowstone National Park, Wyoming.

DOUGLAS R. MILLER,

Brownsville High School, Oregon
Oregon State College, B.S. (*For.*) 1928

Mr. Miller is studying the germination requirements of the seeds of various species of Ribes. He will not complete the requirements of a degree this year. Mr. Miller is a Junior Forester with the Office of Blister Rust Control. He expects to be in California this summer.

MARK PLUNGUIAN,

Waterbury High School, Connecticut.
Syracuse University, B.S. 1930

Mr. Plunguian has been investigating the relative resistance to fire of various wood substances when treated with certain chemicals. He is carrying on this work under a University fellowship. The title of his thesis is "Fireproofing of Fibreboards."

GEORGE M. CORNWALL

George M. Cornwall, editor of the Timberman and beloved friend of the Idaho Foresters, was able to find time this year again to visit our campus. Needless to say he was asked to appear before the Associated Foresters which he so kindly did. Last year Mr. Cornwall was filling box cars from the top and this year he filled our hearts with enthusiasm with which he is always more than bubbling over. The air about the school somehow seems to be different whenever Mr. Cornwall is enroute to our campus and he can't visit us too often to suit us.

Mr. Cornwall has recently spent some time in Europe—especially the Scandinavian countries and Russia—and in his interesting manner told the Foresters of conditions abroad never failing to intersperse numerous jokes and stories in his remarks.

CLASSES USE MILLS FOR FIELD LABS

Owing to the close proximity of the Clearwater Timber Company sawmill at Lewiston and the Potlatch Lumber Company sawmill at Potlatch, the School of Forestry students in the lumbering and wood seasoning courses are conducted through these plants for instructional purposes at various times. Either mill is just one hour's ride from Moscow and this affords unusual opportunity to get first hand information on the manufacture of lumber and processes involved thereto.

Experience in scaling logs is also secured thru visitations to these and smaller mills such as portables, which are not uncommon in just a few minutes ride from Morrill Hall.

THE ASSOCIATED FORESTERS

GEORGE M. JEMISON, '31

The Associated Foresters of the University of Idaho is a club composed of the students and faculty of the School of Forestry. The primary objective of the organization is to promote a closer fellowship among forestry students by conducting a definite social program. Each year this program consists of a campfire meeting, a dance, banquet, and barbecue, interspersed with occasional business meetings and luncheon gatherings.

In addition to the social entertainment, so vital to a forester's life, the club invites prominent foresters who visit the campus, to speak before the organization. This year we have had the privilege of listening to such men as Major Evan W. Kelley, C. K. McHarg, H. G. Andrews, Guy B. Mains, George M. Cornwall, and many others.

As I write about the Associated Foresters' activities my mind is flooded with memories. We can't forget the campfire with its bright tongues of flame leaping into the night air. Then, of course, there is the "feed" and that contented feeling that follows. The story telling, music, and songs have made indelible impressions on my mind.

And remember the Foresters' Ball, a gala event for everyone. "Corked" boots are exchanged for "patent leathers" when the forester steps out. How can we forget the beauties of Nature transforming a ball room into a forest? As we glide among the evergreens we forget that we are tired, forget the work we have done, and the Foresters' Ball is just another memory.

The spring banquet followed by the foresters' field day, the annual barbecue, will long be remembered. An afternoon of contests for the winning of a silver trophy, topped off by a superb open-air barbecue, make lasting impressions.

It is the friendship created by an organization like the Associated Foresters that makes college life enjoyable. No Idaho forester will ever forget the club room and the good old "bullfests". He can never forget the friendships he has made with "profs" and fellow students.

And that is why my mind is flooded with memories today, memories which every true Idaho forester will forever cherish.

The officers for the past year have been:

President ..... Geo. M. Jemison
Vice-President ..... Paul Shank
Secretary-Treasurer ..... Stanley Hepher
Ranger ..... Russell K. LeBarron
Publicity ..... Torney Anderson

The Associated Foresters

THE ARTIFICER

O, the sight and the scent of new lumber,
The sound of a hammer and saw
Send a thrill through my citified system
That leaves me in unsettled awe.

Just the clink of a brick mason's trowel
Is music like chimes from the skies
And a frame-work of two-by-four studding
Is beautiful unto my eyes.

And all day as I sit in an office
Where industry's dervishes whirl
I'm building a home in the country
For me and my wee witching girl.

Stanley Foss Bartlett

"The White Pine King"

THE WHITE PINE KING

(Idaho White Pine, *Pinus monticola*)

The White Pine King whose picture is shown on the opposite page, was the largest Idaho White pine tree known to have grown in Idaho of which any record is available. It grew in Latah County (Moscow—the home of the University of Idaho—is the county seat) near Bovill and stood on the holdings of the Potlatch Lumber Company, Potlatch, Idaho.

The White Pine King was cut December 12, 1911, when the timber surrounding it was removed. The tree had just begun to decay due to wood destroying fungi. Its height was 207 feet and its diameter breast high was 6 feet 9 inches. It scaled 28,900 board feet, enough lumber to build about two average sized five room houses. White Pine King was 425 years old when cut so it must have been a thrifty young tree when Columbus discovered America.

The men standing beside the tree were very well known to the lumber industry of the Pacific Northwest. The gentleman without the coat is Mr. A. W. Laird, until recently general manager of the Potlatch Lumber Company. The other is Mr. T. P. Jones of the same company. The picture and information were supplied to the Idaho Forester through the courtesy of the Potlatch Lumber Company.

XI SIGMA PI

RUSSELL LEBARRON, '31

Xi Sigma Pi is an honorary forestry fraternity which has for its objects the maintenance of a high standard of scholarship in forestry education, working for the upbuilding of the profession of forestry, and promotion of fraternal relations among earnest workers in the profession of forestry. Since the organization of Alpha Chapter at the University of Washington in 1908, eight more chapters have been founded at other forest schools in the United States. Epsilon Chapter at the University of Idaho was organized in 1920.

The primary functions of Epsilon Chapter have been to encourage activities, both curricular and extracurricular, in the School of Forestry. In 1922 a scholarship tablet was placed on a wall of the Administration Building. Annually, since that time, the name of the man having the highest scholastic average, in each of the four classes, has been engraved upon this tablet. For the school year 1929-30, the highest averages were attained by the following men: Charles Wellner, freshman; Thomas Buchanan, sophomore; George M. Jemison, junior; and Arthur Buckingham, senior.

In cooperation with the Associated Foresters, a trophy cup is kept which is awarded to the class winning the contests at the annual Barbecue held by the Associated Foresters. Last year the cup was won by the Junior Class.

Membership qualifications of Xi Sigma Pi are character, interest in forestry, and maintenance of a high standard of scholarship in a forestry school for two and one-half years.

New members this year are Stanley C. Clarke, Mark Plunguian, Dr. Edwin C. Jahn, Floyd Otter, and Professor Gerhard Kempff. The men were initiated December 15. The initiation banquet was held at the Blue Bucket Inn in the evening.

During the year, Major Evan W. Kelley, Regional Forester of Region One, Missoula, Montana; C. K. McHarg, Regional Inspector, Region One; Guy B. Mains, Forest Supervisor, Boise National Forest; George M. Cornwall, Editor of the Timberman; and E. C. Rettig, Land Agent of the Clearwater Timber Company were entertained at luncheons at the Blue Bucket Inn.

Officers of Epsilon Chapter for the year 1930-31:

George M. Jemison ..... Forester
James E. Sowder ..... Assistant Forester
Russell LeBarron ..... Secretary-Fiscal Agent
Stanley C. Clarke ..... Ranger

APPRECIATION

The editorial staff wishes to thank the contributors and advertisers whose cooperation has made possible the publication of this edition of the Idaho Forester.

HOUR CONTROL

"Always the attack" is the formula of victory in fighting a forest fire, as well as in fighting a war, according to the Forest Service. The hour, or part of an hour, required to get to a forest fire with sufficient fighters and equipment to nip it while young is the most critical period in fire suppression, giving rise to the Forest Service expression "hour control".

THE UTILIZATION OF ABANDONED LOGGING RAILROAD GRADES IN A FIRE PROTECTION SCHEME

ALLEN F. SPACE, ex-'22
Senior Ranger in Charge of Road Construction,
Indian Field Service, Klamath Agency, Oregon

The Klamath Indian Reservation is located in the south central part of the State of Oregon, the greater part being in Klamath County. It is rectangular in shape and contains 1,107,337 acres of land, of which about 800,000 acres are timbered. Of this timbered area approximately 175,000 acres have been cut over.

The forested area is under the administration of the Forestry branch of the Indian Service, which branch supervises the logging, grazing, fire protection and other activities of a forestry nature incident thereto.

The western portion of the area is the most accessible so consequently it has been cut over first. Logging railroads were built over which to move the logs. The railroad grades built were spread in a network over the area. The distance between grades on the average was about one-half mile. The road beds were built with a maximum grade of about five per cent, the average being less than three per cent. The logs were hauled to the grades by means of tractors and were loaded on cars by means of steam loaders.

Some few years ago it was proposed that after the logging operations were finished, the abandoned grades be opened up for automobile travel. This would make all parts of the country accessible in case of forest fires and would cut down the elapsed time from the first report of a fire to the time men arrived to fight it. It would also develop fire breaks throughout the forest that could be utilized in case of large fires. In the early spring of 1930 a "20 Motor Patrol" manufactured by the Caterpillar Tractor Co. was purchased with the view of carrying this into effect. The motor patrol was to be used in "blading" the grades out.

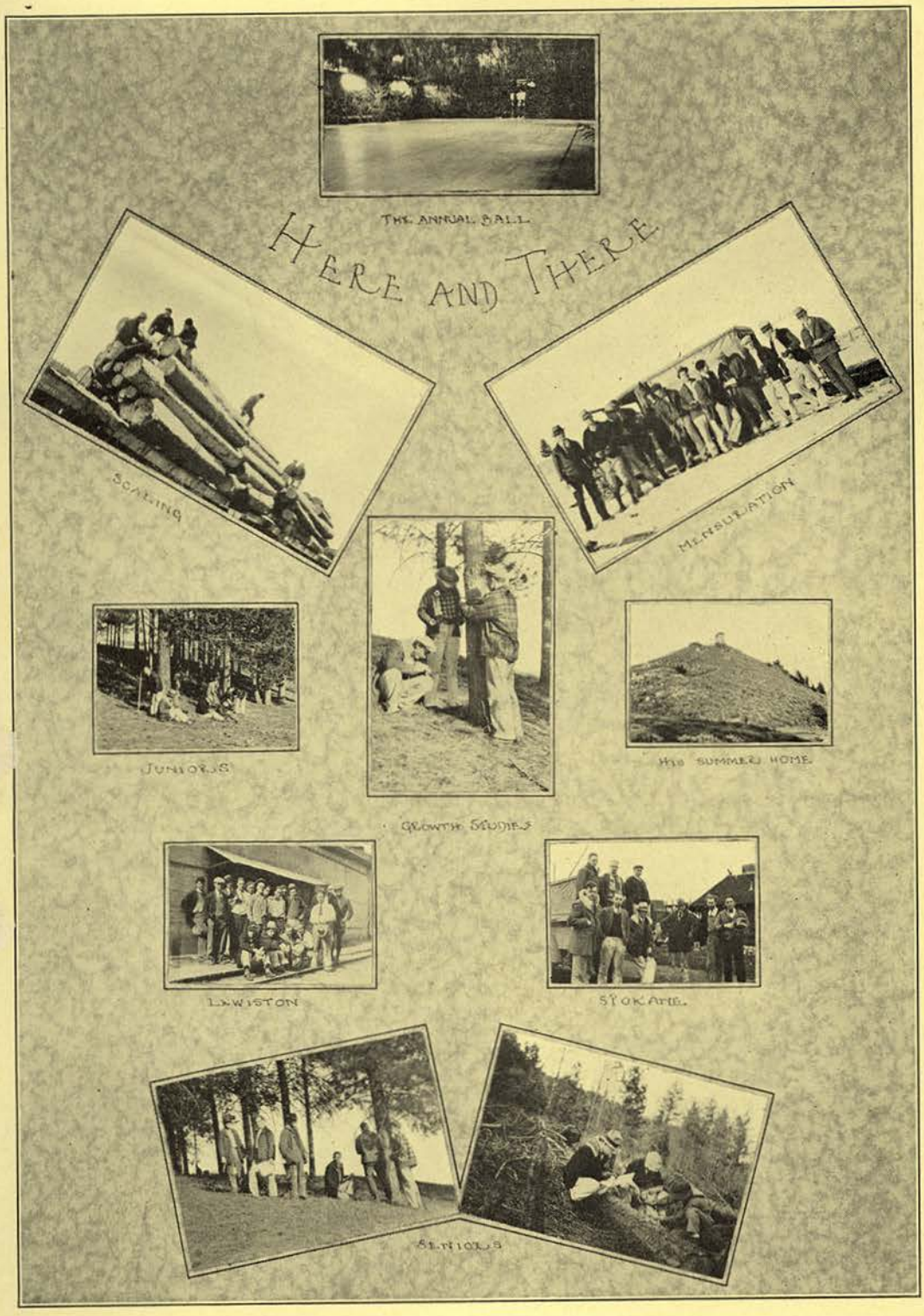
On July 1, 1930 work was started in making roads out of the abandoned railroad grades. In commencing the work, the maps made during the logging operations showing the location of the old grades were used. The various grades thought best to suit the needs were indicated on the maps and the crew started to work on these grades. It was the aim to arrange the work so that the road crew would be working towards incompleted roads at all times.

It was found necessary to blade the earth away from the top of the grades to a depth in places of 14 inches in order to get away from the washboard effect the ties left in the road bed. The logging companies after logging operations removed all the steel and in places removed the ties from the grades for use elsewhere. The machine would easily blade out a mile of road a day where the ties were previously removed.

Where the ties were in place, the work progressed much slower as the machine could blade out roads a great deal quicker than the ties could be removed by hand unless a large number of men were employed. There were on the average approximately 3675 ties to the mile which meant that they would have to be removed ahead of the machine each day. In order to get away from this expense a tie bumper machine which could be attached to the front of the motor patrol was proposed by the writer. This machine was made and tried out and though it failed, the failure was due to too light construction. The machine was then made out of 90 pound railroad steel and it proved a success. Two separate pieces of railroad rails were used. One piece was made somewhat like a rooter and extended out from the motor patrol a distance of 7 feet and was set to the left of center a distance of 8 inches. This rooter pierced the earth a distance 1 inch below the ties and raised the ties, swinging them to the right. The other piece was bent into a circular shape and extended out over the right wheel of the motor patrol coming to the earth 10 inches in front of the wheel. This piece pushed the ties still farther to the right and the blade of the motor patrol crowded the ties off the grade. The machine was called a tie bumper due to the bumping effect the curved piece had on the ties. When in operation it was found best to have the long rooter go under the ties a distance of 16 inches from the left end of the ties. A mile of road per day could be made after bumping the ties off the grade with the machine.

The cost of making the abandoned railroad grades into good roads was $26.74 per mile. An automobile speed of 30 miles per hour can be maintained on all the grades.

(Continued on page 49)


HERE AND THERE
THE ANNUAL BALL
SCALING
MENSURATION
JUNIORS
GROWTH STUDIES
HIS SUMMER'S HOME
LEWISTON
STOKANE
SENIORS

"THE TURNING POINT"

O. C. Munson, '21

District Plant Engineer, Pacific Telephone & Telegraph Company, Santa Rosa, Calif.

Foresters of the future will label the start of the twentieth century as the "Inception Age" for fire protection in the United States, for it was then that this activity was truly born, experimented with, developed, and finally refined.

In a few short years prior to the great world war, we saw this activity develop from the "foot and horse patrolman" stage to that of scientific detection and suppression. The turning point can be definitely established as August, 1910, and this date will be cited in future forestry history.

The slight development prior to 1910 was justified by past experiences, and no administrator of any protection agency need apologize or alibi for the economic policy he then followed. Nevertheless, this state of unpreparedness resulted in the most disastrous experiences and depredations that can now be visualized; but from these ashes of disappointments and gigantic losses, there sprouted the fertile seeds of realization that better methods must be developed.

We hold the most sincere admiration and respect for the pioneer personnel in forest protection activities, who so ably and efficiently developed and supervised the many improvements of policy, procedure, and organization, which followed so closely upon the disastrous 1910 season. How well they functioned can now be fully realized, when we note that few major changes or developments have been made subsequent to their original plans.

We salute the men in the field, who sweat and toiled, starved and endured untold hardships during those trying times. Without adequate transportation, communication facilities or developed detection methods, they carried on under adverse conditions which would have caused men of less caliber to surrender to the inevitable fate against which they battled.

When we visualize the present net-work of roads, trails and telephone lines throughout our forest areas; when we note the high degree of present day standardization; when we see the modern look-out towers and their incidental instruments and maps for instant detection and accurate location of fires, and then watch the dispatch with which the fires are found and suppressed, we are tempted to think that the 1910 season had a great value which exceeds its liabilities.

WHEN THE DRIVE GOES DOWN

Pea soup and baked beans,
  Peaveys, pickaroons;
Jacks on the headworks
  Chantin' mournful tunes—
Pike-poles and cant-dogs,
  Jams and slippery bark;
Auger holes and capstans
  Squeakin' in the dark—
Boom-logs, river hogs;
  Little time for dreams;
White foam and quick rips,
  Frothin', fumin' streams—
Deep gorge and ice pack,
  Nature in defense,
Wet clothes and fire-light—
  Slavin' for a pence—
Cold tea and cod-fish
  And take it off'n tin—
Backwash and cross-haul,
  Ice on bearded chin,
Long task and hard toil,
  Fingers froze in mitts,
Sleepin' on the hoof, boys,
  Batteaux stove to bits,
Key-logs and sluiceways,
  Dams that groan and shake—
Death around the corner
  Waitin' for a break—
Calked boots and curses,
  Song from purple lips,
Plaid pants and green-backs,
  Clicking poker chips,
Red shirts and bright lights
  Glowin' in the town—
We couldn't stand the gaff if
  The drive wan't goin' *down*.

Stanley Foss Bartlett

EXTENSION FORESTER

Stanley C. Clarke, a senior in the School of Forestry, has been appointed by the University Extension Division as extension forester to the state of Idaho. His appointment was made effective March 1. "As extension forester Mr. Clarke brings an unusually rich background to the work," said Dean E. J. Iddings, director of the Extension Division, in announcing the appointment. His enthusiastic interest in trees, and his experience in other fields, give him a good understanding of the problems involved.

THE FORESTERS' DANCE

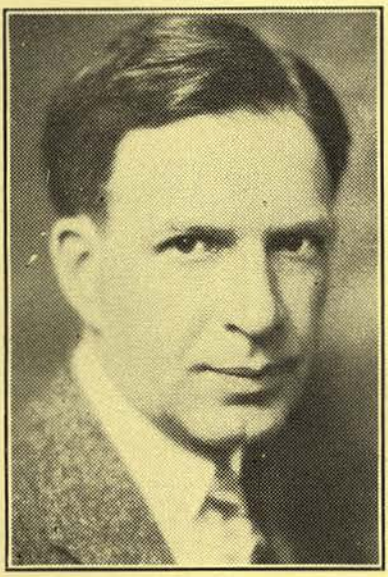
MELVIN COONROD, '32

The foresters' dance held November 22, Saturday evening in the girls gymnasium turned out to be one of the best dances in the annals of the University. The tickets were sold long before the day set for the dance and many couples were turned away. Little did anyone realize the splendor of a dance hall decorated with spruce, fir, and cedar boughs until they entered the hall.

As one stepped through the door of the cleverly built log cabin which formed the entrance, he seemed to be in a veritable forest of evergreens. The odor of cedar and fir filled the hall. Light which filtered down through the branches from above the dance floor cast shadows and gave one the impression of being under a dense canopy of forest growth. The walls were covered with small trees. A tent in one corner with a campfire and coffee pot gave a true wood's atmosphere.

Everything harmonized; even the programs, which were made of cleverly designed veneer and a spruce cone for a tassel. The dancing couples, whirling in and out of the shadows in response to a snappy dance band, made this one of the social successes of the year.

The guests were Miss Permeal French, Mr. and Mrs. F. G. Miller, Mr. and Mrs. E. E. Hubert, Mr. and Mrs. F. W. Gail, Mr. and Mrs. E. C. Jahn, Mr. and Mrs. G. S. Kempff, Mr. and Mrs. A. M. Sowder, Mr. L. E. Spence, and Mr. and Mrs. F. L. Otter.



DR. MERVIN G. NEALE, *President University of Idaho.*

"HERE WE HAVE IDAHO"

The picture on page one is that of the entrance to the Administration Building, the main building on the University of Idaho Campus. To the students it is known as the "Ad" building. The twelve acre School of Forestry Arboretum is located back of the "Ad" building to form a picturesque background.

SOCIETY MEETS AT MOSCOW

Forty out-of-town delegates attended the meeting of the Northern Rocky Mountain Section of the Society of American Foresters held at the School of Forestry, University of Idaho, Moscow, the afternoon of February 23, 1931. The faculty of the School and a number of the students were also present.

In the absence of Mr. S. A. Wyckoff, Vice-president, Mr. C. L. Billings, Assistant General Manager of the Clearwater Timber Company, Lewiston, Idaho, presided.

The principal speaker of the afternoon was Mr. H. J. Andrews, senior forest economist, Forest Service, Portland, Oregon on the subject, "The Forest Survey." After mentioning some of the difficulties encountered in this work, Mr. Andrews explained in a thoroughly interesting manner the purposes of the survey and how it is being conducted.

Mr. Andrews was followed by Dr. E. E. Hubert of the School of Forestry on Decay Resistance Studies. Some projects in Wood Chemistry were discussed by Dr. E. C. Jahn, also of the School of Forestry. A general discussion followed each paper.

In the evening the visiting delegates joined the Associated Foresters, University of Idaho, in their annual banquet at the Blue Bucket Inn.

SOME MEDICINAL USES OF BARK

STANLEY C. CLARKE
Extension Forester, Extension Division, University of Idaho

The bark from trees has been utilized for a period of over two thousand years for the treatment or cure of a great many diseases. Its use has generally been in powdered form, or as decoctions and infusions. Some tree barks are used in quantities running into thousands of tons per year.

For some diseases the effective dose required to be taken was rather bulky, but as chemistry developed, rapid advances were made in searching out the active principles, and eventually commercial processes were developed to secure the medicinal principles in a concentrated form, in quantities. Due to these advances in chemical technic, doses have become much smaller, quicker in action, less distressing to the patient, and are also capable of being made into more palatable forms for administration.

We still have a few barks that are used in large quantities for medicinal purposes in an extract form. These are generally barks that contain a large number of different chemical constituents, which are very difficult to separate from each other, and also in some cases when they have been separated in a small expensive way in the laboratory have been found to give physiological reactions that are very similar to each other.

Cascara Found In The West

The latter properties are characteristic of cascara (*Rhamnus purshiana*) bark. Fluid extract of cascara is probably used more by hospitals and the medical profession in general for cathartic and tonic purposes than any other drug. Also cascara is generally the principle active ingredient in most proprietary preparations purchased for self-medication by the public today for cathartic or laxative purposes. About 2,000 tons of cascara bark are used annually by pharmaceutical manufacturers; this quantity represents about $1,000,000 for the bark-collecting industry.

The range of cascara is from British Columbia through California into Mexico; eastward through northern Washington and Idaho to western Montana; also along the eastern slope of the Sierra Nevada range, and into the mountains of Colorado, Arizona, New Mexico, and western Texas.

The best formed trees from which the greatest amounts of bark are collected are found in the Pacific Coast region of Oregon and Washington. The trees are from 30 to 40 feet high and rarely more than 10 to 12 inches in diameter. The wood is of no economic value today, but the demand for the bark is increasing. The peeling of the bark is done from early spring until such a time in the summer when the bark will not peel or "slip" easily. The trees are first girdled at the ground and the bark is peeled from this point up as far as can easily be reached. The tree is then cut down and the peeling is continued to the top of the main stem. The main branches down to about two inches in diameter are also peeled. The bark is then dried during which it loses about one-half of its green weight.

Cascara regenerates itself from seed and by sprouting from the stumps. More care is now taken to protect these trees from fire, and the practice of using young growth which is economically too small to peel is being discontinued.

The United States Pharmacopea defines cascara as follows: "The dried bark of *Rhamnus purshiana* collected at least one year before being used." The purpose of storage is to allow certain changes to take place in an enzyme, contained in the bark, so as to prevent "griping" (a severe intestinal muscular contraction) which is caused by uncured bark.

Some of the larger manufacturers store many tons of the bark in specially constructed lofts for at least three years, which period of time their laboratories have found necessary to change the enzyme, thereby giving the least discomfiture to the patient.

Probably the next most important domestic bark for medicinal use is that obtained from white pine. The official definition of white pine bark is as follows: "White pine bark is the dried inner bark of *Pinus strobus,* and shall not contain more than 2% outer bark and not more than 2% of foreign organic matter."

Its therapeutic use is mainly as an expectorant and is administered almost wholly in syrup form. Such syrups generally contain extracts of a combination of an equal part by weight of wild cherry bark (*Prunus serotina*) and smaller quantities of balsam poplar buds, bloodroot and sassafras bark. Why only *Pinus strobus* bark and not *Pinus monticola?* The answer probably is that the manufacturing pharmaceutical industries are practically all located in the range of *Pinus strobus.* The quantity of bark used is roughly estimated as hundreds of tons per year.

Other domestic barks known to foresters, but used in lesser quantities are fringe tree (*Chionan-*

thus virginica), butternut (*Juglans cinera*), white oak (*Quercus alba*), arbor vitae (*Thuja occidentalis*), white sandalwood (*Santalum album*), guaiacum (*Guaiacum officinale*) and soap bark (*Quillaja saponaria*).

Cinchona Trees Essential

The one foreign tree that outranks all trees for its valuable bark is the cinchona tree; it is also known as Calisaya, Peruvian and yellow bark, and is the source of all quinine.

The cinchona tree is an evergreen and averages between 40 to 80 feet high, with a base diameter of one to four feet; the leaves are laurel-like. Its natural range is along the eastern slope of the Andes Mountains between 10° and 20° latitude. This area has rain about nine months of the year.

The powerful enemy which cinchona combats is malaria, often called ague, marsh fever or jungle fever. Quinine is one of the few specific remedies, it being a specific remedy against malaria. Quinine cannot—as yet, at least—be produced synthetically; its production is dependent upon the successful rearing and tending of the cinchona tree.

Value of Cinchona Early Known

The knowledge of the value of this bark for treatment of fevers was obtained from the South American Indians by the Jesuit missionaries in the early part of the 18th century, at which time the bark was selling for its weight in silver. So naturally, the natives guarded their indigenous inheritance with a jealous eye and endeavored to prevent explorers from obtaining young plants or seeds.

The groves were unprotected by the government, were without ownership, and as a rule, became common property and a prey to mercenary parties who had little regard to future production. The demand was increasing and the supply decreasing and it was only a question of time when the destruction would be complete; naturally, this condition aroused the concern of medical and other scientific men. (This reads like our own forest history.)

It was surmised that the trees would flourish wherever the climatic and other conditions were somewhat similar. In 1846, seeds were sent to France, but they yielded only ornamental trees. In 1853, Dutch explorers sent seeds to the East Indies, and in 1859 the British planted seeds in their tropical colonial possessions. Both the Dutch and the British were so successful that today they are the producers and carriers of cinchona, a fact not often appreciated by American manufacturers of quinine and its salt from the bark.

The cinchona tree hybridizes very well, so that species and varieties have been developed yielding from 5 to 15% total alkaloids. The bark is stripped from the roots, stem and branches, then dried and stored before being prepared for commercial use.

Cultivated bark is collected by uprooting, coppicing, "shaving", and "mossing". Uprooting consists in pulling up the tree, barking the whole tree, and replanting the ground after fallowing. This is the method found to be most successful. Coppicing is cutting the shoots back at periods of 6 to 9 years. Shaving is the process of shaving off the outer bark of 3 to 5 year old plants with a draw knife; the bark removed is replaced by a bark richer in alkaloidal content. Mossing consists in removing alternating strips. The decorticated portion is then covered with moss; this method gives an annual yield of rich bark during the tree's entire life. More quinine is produced on shaded bark than on bark exposed to the sun's rays. It has also been discovered that the first crop of cultivated trees renders the soil, at least temporarily, incapable of producing a satisfactory second crop.

The biggest problem today among the growers of cinchona trees is to find more areas suitable for their production to take care of the increasing demand for quinine. The Empire Forestry Service gives the silvicultural requirements and cultivation of cinchona in India as follows: as to climate, cinchona will stand neither great heat nor frost; the ideal temperature may be taken at about 75° C. A hot sun with no shade is unfavorable. The limits of rainfall are roughly 78 to 180 inches per annum. The altitudinal limitations are 1000 to 5000 feet elevation.

In preparing a site for the cinchona tree, the forested areas are felled from November to March, and the debris is burned in March.

Before planting in plantation form, 4 feet by 4 feet spacing, the seedlings are required to stay in the nursery for at least six months. Seedlings are twice transplanted. The nursery beds are sheltered by a sloping roof of thatch, which must be water-tight and the plants must be carefully watered with a fine spray. After hardening the seedlings in the nursery, planting is done between May and August, and cultivation is kept up periodically around all the trees. Harvesting of the bark begins in about the fourth year, which consists of bark from thinnings and prunings, and from plants

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ANNUAL BANQUET HUGE SUCCESS

PAUL AUST, '32

The fifteenth annual banquet, one of the major events on the Associated Foresters' calendar was held Monday, February 23 at 6:30 in the Blue Bucket Inn.

The informal meeting was officially called to order by Toastmaster George Jemison who outlined the activities of the Associated Foresters during the past year, incorporating in his talk, many stories of students and faculty members.

After the one hundred twenty five visitors, alumni, and students had finished the excellent repast amid a delightful musical program furnished by members of the University music department, the meeting was again turned over to Toastmaster Jemison who introduced Mr. H. J. Andrews, senior forest economist with headquarters in Portland, Oregon.

"Recreation is playing a big part in the reforestation program of eastern states", stated Mr. Andrews. "There they are developing their cut-over and burned over lands, reseeding thousands of acres annually."

Mr. Andrews cited his home state, Michigan, as an example of the prevailing conditions throughout the eastern states. This state, he pointed out, having an area of 37,000,000 acres, was originally all but 4,000,000 acres forested. By 1880, most of the pine was cut out, and the general opinion was that when the timber had been removed, the land would revert to farming; but such was not the case. Last year, 1,700,000 acres were turned back to the state for non-payment of taxes. Much of this land has been planted to pine and will be used to a large extent for recreational uses, and the timber utilized when mature. Mr. Andrews closed his talk with an outline of the forestry organization of the State of Michigan, which he thought was one of the most progressive types in the United States.

"The Layman in the Forest" was the topic chosen by A. E. Whitehead of the University of Idaho English department who stated that he envied the foresters in their outside environment and work in the open. He told of his own experiences in the forests and urged the foresters not to forget the beauties of Nature while going about their daily work. Many of his remarks were directed to his listeners in a humorous vein.

After several musical selections by Miss Dorothy Frederickson and Miss Pauline Paterka had been presented, Mr. Roy A. Phillips, supervisor of the Nez Perce National Forest, was introduced and stated that the forester was a man of all work, and briefly outlined the duties and trials of the profession.

Agreeing with Mr. Andrews, he said that recreation is playing a more and more dominant part in the control and care of forests. "Although we now close the forest to visitors during the dry season on account of the fire hazard, he stated, "we shall soon be forced to open them at all times. The forester will be obliged to use education in dealing with the public rather than restriction as his guiding motive."

Mr. Phillips explained the importance of survey work in Idaho forests. He pointed out that this phase was recently accomplished in the Nez Perce forest for the first time.

As a closing remark, Mr. Phillips stressed the need of technically trained men, and predicted that very shortly they would be the only applicants considered by the Forest Service.

Captain B. M. Crenshaw, a member of the University faculty delivered a very interesting talk on "Forestry and War". He declared that the necessity for wood during wartime for use in airplanes, barracks, bridges, railroads, housing, rifle stocks, and other uses was evidenced by the expenditure of over $818,000,000 in the World War. He said that over 175,000,000 board feet of lumber were cut for airplane use alone. In addition, a much shorter method of seasoning lumber was perfected during the war. He closed his talk by giving some of his experiences in the French forests.

Mr. Walter Field, a graduate of the Idaho school of forestry, and assistant land agent for the Clearwater Timber Company of Lewiston appeared for Mr. E. C. Rettig, also a graduate of the school and at present land agent for that company. Mr. Field read a paper prepared by Mr. Rettig, the title of which was "Forestry—Old and New". Mr. Field stated that technically trained men are becoming more and more necessary in the profession of forestry all the time.

Some very interesting accounts of his experiences with the University during its early days was given by Judge J. H .Forney who helped draw up the charter of the University which was recognized in 1898. He stated that the University has grown beyond his "most sanguine expectation."

With final and conclusive "wise cracks" by the toastmaster, the fifteenth annual banquet of the Associated Foresters went into history.

Obituaries

ALLISON W. LAIRD

Allison W. Laird, one of the most widely known lumbermen of the West, and an outstanding figure in Idaho, died at Pasadena, California, April 30, 1931 at the age of 67.

Mr. Laird began his business career as a bank messenger and rose steadily to a commanding position in the business world, holding at the time of his death the general managership of the Potlatch Lumber Company, which operates saw mills at Potlatch and Elk River, Idaho; the general managership of the Idaho and Montana Railway Company; and the presidency of the Potlatch State Bank, and the Elk River State Bank. He also took an active interest in forestry affairs, and had served for a number of years as president of the Western Forestry and Conservation Association, having been reelected only in March for the current year. As the chairman of a National Committee on Forestry he was instrumental in securing greatly increased federal aid for the protection of the nation's forest resources.

WILLIAM E. BUCKINGHAM

William E. Buckingham, ex-'27, died in Portland, Oregon, November 2, 1930, following a major operation which terminated in pneumonia. He was 33 years of age.

He accepted an appointment on the Clearwater National Forest in 1919, and continued in the service of that organization until his death, furloughing from time to time to continue his school work and would have been able to complete the requirements for his degree in about one more year. That he was successful in his work with the Forest Service is attested by the constantly increasing responsibilities placed upon him. At times in ill health and never rugged, he carried on without complaint with great energy and efficiency. Few men in the Forest Service had greater promise. He was widely known and everywhere highly respected.

Funeral services were held at the Tualatin Plains Presbyterian Church near Hillsboro, Oregon, where for twenty-five years Mr. Buckingham's grandfather was the pastor.

EDWARD C. PULASKI

Edward C. Pulaski, hero of the 1910 forest fire, among the most disastrous the country has ever known, and long a ranger in the Forest Service, died in Coeur d'Alene, Idaho, on February 2, 1931, a few days before his sixty-third birthday.

Mr. Pulaski gained national recognition, 20 years ago, by bringing a crew of fire fighters back from a most perilous situation. Unable to find his way out from the burning forest because of the dense smoke, Mr. Pulaski led the men into a mine tunnel, from which he and one of the others had first thrown out a quantity of stored material, including hundreds of pounds of powder. Here he ordered the men to lie down on their faces, while he stood at the mouth of the tunnel, holding back, at the point of a gun, the panic-stricken men who tried to leave. All the men who obeyed the order to lie down escaped with their lives when the fire had spent its force. Five who had not obeyed these orders were suffocated. Mr. Pulaski was seriously affected by the fire and smoke, but recovered sufficiently to return to his duties.

—The Official Record U.S. Department of Agriculture.

Morrill Hall—The Home of the School of Forestry. The Forestry quarters are located on the third and fourth floors of this building.

WOOD CONVERSION LABORATORY

In carrying on research in the chemical and mechanical utilization of wood it was soon found that equipment which would make it possible to conduct the investigations on a semi-commercial scale was essential. The School had no room where such equipment could be installed, and to provide such space the legislature voted a special appropriation of $4000. The plan is to use this money to put up a frame structure within easy reach of Morrill Hall and construction is now under way. The building will be 30 feet by 70 feet, the bulk of the space to be used as a wood conversion laboratory and the rest of it for the preservative treatment of wood. The floor will consist of reinforced concrete so as to accommodate the heavy equipment to be installed. The laboratory will be ready for occupancy by July 1.

WOOD CHEMISTRY LABORATORY

Incident to the remodeling of the fourth floor of Morrill Hall last summer the School of Forestry was able to add nearly fifteen per cent to its floor space. Besides providing for a range management laboratory, a store room and two offices, this additional space made it possible to establish a large laboratory for research in wood chemistry. This laboratory was opened last August, and marks an expansion in the research program of the School of Forestry and of its products laboratory.

The work is being conducted by Dr. Edwin C. Jahn, a wood chemist and technologist. Dr. Jahn had his training under Dr. L. H. Wise of the New York State College of Forestry and Dr. Harold Hibbert of the Pulp and Paper Institute at McGill University, taking his Ph.D. from the latter institution in 1929. The year 1929-1930, Dr. Jahn spent in Sweden as a fellow of the American-Scandinavian Foundation, in a study of the pulp and paper industry.

The need for research on the chemical utilization of wood is based on the necessity for closer utilization of the wood produced on our timber lands, particularly as related to mill waste and the inferior species. The manufacture of lumber creates an enormous waste, which is a potential raw material for hundreds of other products.

SPECIFIC GRAVITY OF THE FIRS

GEORGE M. JEMISON, '31

Specific gravity, aside from actual strength data, is probably the best indicator of the strength of clear wood of any species. Specific gravity figures may be used (6):

1. For estimating the mechanical properties of any particular timber.
2. For selecting timber for any particular purpose.
3. For comparing the various species.
4. For determining in what way the species are exceptional and to what uses they are best adapted.

The increasing scarcity of many species of timber used in construction and building, is opening the field for the true firs. Thus a determination of density may assist in finding species of the genus *Abies* that are adapted for a general or a particular use.

Specific gravity figures are here presented for all the firs recognized as indigenous to the United States by Sudworth (11). The accepted common and botanical names are as follows:

1. Corkbark Fir (*A. arizonica* Merriam.)
2. California Red Fir (*A. magnifica* A. Murray).
3. Southern Balsam Fir (*A. fraseri* Poiret).
4. Balsam Fir (*A. balsamea* Miller).
5. White Fir (*A. concolor* Lindley & Gordon).
6. Lowland White Fir (*A. grandis* Lindley).
7. Alpine Fir (*A. lasiocarpa* Nuttall).
8. Shasta Red Fir (*A. magnifica shastensis* Lemmon).
9. Noble Fir (*A. nobilis* Lindley).
10. Silver Fir (*A. amabilis* Forbes).
11. Bristlecone Fir (*A. venusta* K. Koch).

A correlation between specific gravity and number of annual rings per inch was attempted, all species being completely analyzed. Since there is considerable variation in the specific gravity of individual trees of the same species, the results of this study should be taken as indications rather than fixed values.

Previous Work

Although no specific gravity figures are available for all of the indigenous firs, there are a number of references as to density of several species of the genus. Newlin and Wilson (7) made specific gravity determinations on five to twenty trees, four tests being made on each tree. The following results, based on volume when oven-dry, were obtained: alpine fir .32, silver fir .42, balsam fir .41, lowland white fir .42, noble fir .41, and white fir .44.

Gaskill (2) gave an arbitrary determination of specific gravity for several species. He compared Sargent's figures (10) with other available data and eliminated all manifest absurdities. He found the following specific gravities: alpine fir .42, silver fir .42, balsam fir .38, lowland white fir .38, noble fir .46, white fir .36, and California red fir .44.

Record (8) gives the following figures: silver fir .42, lowland white fir .35, noble fir .46, white fir .36, and California red fir .47. Other authors give similar data for some or all of these species (1, 3, 5, and 6).

Scope and Methods of Study

Origin of Data

The data presented in this paper are based upon 1260 tests. From four to 21 trees of each species were tested with about five to 25 specific gravity determinations made upon each tree.

Selection of Material

The material used was collected primarily through the assistance of the U. S. Forest Service. Where possible, specimens were taken from the upper part of the first log.

Requirements of Test Pieces

Each specimen of a species was sawed into one-inch cubes which were then sanded until smooth. Only clear test blocks were retained. Defective blocks were excluded together with those showing eccentric growth. The latter step eliminated inaccuracies which would arise from compression wood specific gravities.

No differentiation was made between heartwood and sapwood in cutting the test pieces. Due to macroscopic similarity, it was impossible to make any distinction in most cases. Betts (1) found no difference in the mechanical properties of heartwood and sapwood, which would indicate that specific gravity is nearly the same in the heartwood as in the sapwood.

Numbering and Testing Blocks

The test pieces were numbered by first giving each "set", or those blocks cut from one tree, a "set number". This number was followed by a letter indicating the species, in most cases the first letter of the species name. All blocks within a set were then numbered consecutively. This system of numbering made possible the checking and the elimination of doubtful specific gravities within a species.

The number of annual rings per inch on each block was measured and recorded for each species.

The blocks were oven dried at a temperature of 100° C. for 48 hours, after which they were placed

in a desiccator and weighed separately, using a triple beam balance. After weighing, the pieces were dipped in melted paraffin and the oven-dry volume obtained by immersing in a beaker of water previously counter-balanced on the balance (4 and 9). Care was taken to scrape off any excess paraffin before testing. The blocks were immersed by impaling them on a needle and lowering into the water until the upper side of the block was one-half inch beneath the surface and unaffected by surface tension.

Methods of Computing and Summarizing Data

The standard method of calculating specific gravity was followed and is given by the following formula (4, 9):

$$\text{Sp. Gr.} = \frac{\text{Wt. of block oven dry — grams}}{\text{Wt. of water displaced — grams}}$$

All results were carefully analyzed. Distinctly abnormal specific gravities were noted, and the corresponding blocks were checked and retested. If the abnormality was still present, the figure was rejected from the summary that followed.

Average specific gravities for each set were obtained. An arithmetic and a weighted average of the sets within a species was then calculated. Weighted averages of the number of annual rings per inch for each set and species were also calculated.

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TABLE I

AVERAGE SPECIFIC GRAVITIES OF ELEVEN SPECIES OF INDIGENOUS FIRS (*ABIES*), BASED ON 1260 TESTS

Common and botanical name	Locality where grown	No. of trees	Total no. of tests made	Range in rings per inch	Ave. no. of rings per inch	Sp. gr. based on volume when oven-dry.	
						Arith. average	Weighted average
No. 1	2	3	4	5	6	7	8
1. Corkbark fir (*A. arizonica*).	Arizona	5	77	9-29	15.1	.33	.34
2. California red fir (*A. magnifica*).	Oregon California	7	63	12-48	24.7	.35	.35
3. Southern balsam fir (*A. fraseri*).	Virginia Tennessee	9	193	3-53	17.6	.37	.37
4. Balsam fir (*A. balsamea*).	Wisconsin Maine	21	335	5-39	14.7	.39	.38
.5 White fir (*A. concolor*).	Utah Ore. Cal. Ariz. Wyoming	11	129	6-63	19.9	.40	.40
6. Lowland white fir (*A. grandis*).	Idaho Washington California	5	56	4-40	17.8	.44	.42
7. Alpine fir (*A. lasiocarpa*).	Idaho Utah Wyoming Washington	8	94	8-54	28.5	.42	.43
8. Shasta red fir (*A. magnifica shastensis*).	Oregon California	7	89	8-64	31.7	.45	.44
9. Noble fir (*A. nobilis*).	Oregon California Washington	7	72	4-56	20.9	.46	.45
10. Silver fir (*A. amabilis*).	Washington	4	37	4-44	19.2	.45	.45
11. Bristlecone fir (*A. venusta*).	California	7	116	6-64	20.1	.61	.59

THE RELATION OF BARK THICKNESS TO THE DIAMETER OF WESTERN YELLOW PINE

CLARENCE P. DITTMAN, '31

Introduction

Studies in bark thickness for a given species of trees are comparatively uncommon undertakings in this country. In the construction of volume and taper tables, the thickness of bark is taken into consideration, but then only to obtain the desired results that these tables should give. Often a cruiser may work under the assumption that for the same species of a given diameter at breast height there is a uniform thickness of bark. This, however, is not the case. For a given diameter the bark is thickest on exposed and rapidly growing trees and thinnest on sheltered, slow growing trees (1). It is also a known fact that as trees increase in diameter, the greater will be the actual thickness of the bark together with a wider possible variation. Therefore a cruiser who does not consider these differences but merely guesses at the bark thickness of a selected tree may introduce serious discrepancies in the construction of a table. These tables, in turn, may underestimate thick-barked trees growing on exposed sites, or give a correspondingly less volume for trees growing in the shelter of a stand.

A publication resulting from a bark thickness study of redwood on the Pacific Coast by J. E. Pemberton (2), brings out the relation between bark thickness and diameter of that species. He found that in plotting the average bark thickness over diameter outside bark at breast height, a straight line resulted which passed approximately through the origin. This shows that the ratio between bark thickness and diameter at breast height for redwood may, for all practical purposes, be treated as a constant.

However, due to the wide difference in the general character of the bark of redwood and yellow pine, it could almost be expected before undertaking a study of the latter that the results would not be the same as for redwood, because the stringy bark of redwood does not slough off nearly as readily as the scales of the western yellow pine bark. This is particularly true as the tree reaches maturity. In redwood we deal with a tree that preserves practically all of its bark from the time it starts growing until its death, while with yellow pine the total amount of bark on the tree at a reasonable age is not the result of a cumulative growth but rather the difference between what has been actually put on by the tree and what has sloughed off.

Object of Study

Like most other trees of a given species, it is a known fact that the outermost protective covering of western yellow pine varies both in thickness and color for trees of different diameters. Just what this relation is has apparently never been worked out. Therefore, the object of this study is an attempt to determine the relation of bark thickness to diameter for this particular tree. Owing to the wide range of western yellow pine, it is understood that whatever results or conclusions are brought out in this study, they may be applicable only to the region from which the data were collected, or possibly to sites within other regions where factors controlling growth conditions are similar.

Methods and Equipment Used for Obtaining Data

Field Work

The data necessary to carry on this study were obtained from 326 trees, ranging from nine to twenty-seven inches in diameter, found growing on sites of approximately the same quality in the Weiser National Forest in central Idaho. The classification of these sites was determined by the relation of height growth based on total age of the dominant trees growing within arbitrary boundaries which were believed to surround each particular plot. Eleven such plots were staked out, eight of which were classified within the limits of site quality three. These limits for this particular site quality included trees from 65 to 75 feet tall when in the 90 year age class. From these eight plots the data necessary for this study were collected.

Having determined within reasonable limits the site classification and the location of the plots, the next step was to secure proper measurements from trees within the diameters stated above found growing on these plots. This was done in the following manner. Each tree was bored through the bark with an increment borer at a height four and one-half feet from the ground. The diameter and bark thickness for each boring was then recorded for each individual tree, a small, cylindrical scale graduated to tenths of an inch being used to measure the bark thickness and a diameter tape also graduated to tenths of an inch being used to measure the diameter. Since the term bark may have two meanings, namely that part of the stem

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FROSH WIN THE ANNUAL BARBECUE

MAURICE E. ERICKSON, '34

Along about the middle of May each year there is an event which takes place among the Associated Foresters at the University of Idaho called the Foresters' Barbecue. Every loyal member in each class gets into his field clothes and joins the gang for this spring frolic. The barbecue this year was held Wednesday afternoon, May 13, at the Luvaas Grove, with 75 attending.

The first event on the program was a game of indoor baseball. The frosh offered to stand the rest of the group and were just beginning to show their superiority when the game had to be broken up. The afternoon was going fast, and there were yet plenty of events and contests on hand.

The baseball game served to loosen up all stiff joints so competition among the contestants was keen. In the first event—the 50 yard dash—Cline and March represented the freshmen, Baldridge and Gaffney the sophs, Andrews and Arthurs the juniors, and Schumaker and Jeppesen the seniors. March placed first, Baldridge second, and Schumaker third.

Next came the egg-tossers. A representative from each class stood in a 25 foot circle and tossed or threw an egg in the air as high as possible and caught it without breaking it. This was repeated until the egg was broken or the contestant fouled by stepping out of the ring. Schaller for the sophs won first in this event, but it was felt that he fouled by using a fowl "hen fruit". However, his first was granted and McCormick for the frosh was given second place. No one tried to use a hard boiled egg this year, and the over-ripeness of several used was not questioned.

The 100-yard dash was next, which March won with Baldridge right on his heels and Schumaker a close third. Some really exceptional sprinting was shown by all who entered. Fighting blood was coming to the surface rapidly..

The century race proved to be a strenuous contest, but the next event was the most strenuous of all. Newcomer, senior, the veteran of four years in this contest, easily won the event, with Ensign for the juniors, second.

The sophs, represented by Baldridge, Gaffney, Schaller, and Parks, grabbed first place in the relay race, with the seniors second and the juniors third.

Some clever climbing was exhibited in the tree climbing contest. Parks (soph) lost no time in digging the spurs in the tree to reach the goal and descend to first place. Pechanec (senior) suffered the only casualty of the day when his spurs failed to hold in descending the tree and his forearms were "barked." Ensign (junior) took second, and Thornber for the frosh, third, with a three point landing.

The frosh seemed to excel in foot work, since they won the sprints, and in the three-legged race in which they were represented by Dresskell and Ward, they again showed their superiority. The seniors placed second. Also in the sack race the frosh representative came through to win. Ward was the winning frosh.

After this event, everyone gathered around the pond to see the contestants take their duckings good-naturedly while attempting to log roll. No contestant stayed on the spinning log even 5 seconds, but Ensign (junior) took first with an average time of about 4 2/5 seconds, with Dresskell (frosh) second, and Parks (soph) third.

Back to dry ground once more, the boys decided on a little wood-sawing contest. Thornber and Gregory composed the frosh saw gang and captured first honors in this event, setting up an exceptional record. The seniors also sawed.

Bucking or one-man sawing, however, was about a no contest affair. LeBarron captured a first for the seniors and the saw buzzed so fast the log caught fire.

Torney Anderson, senior, demonstrated some of the fine points of log chopping, to take this event. He kept all the freshmen foot racers busy retrieving chips long after his brief exercise was over. Thornber handled the axe for the frosh, Schaller for the sophs, and Ensign for the juniors. Thornber took second, and Ensign third. Afterwards Anderson put on a chopping "axhibition" to prove his superiority and clinch his argument.

The last contest was the most exciting and hard fought of all. Each class picked its heaviest men for the tug-of-war. The judges decided the sophs were the winners, giving the frosh second place, and the seniors third place.

The score revealed the following results: frosh first, with 39 points; sophs second, with 35, and seniors third, with 28. The frosh therefore will have possession of the silver cup for next year.

By this time arrangements for the big feed had been completed, so the grub line quickly materialized. The meal was pronounced excellent by all participating, with the huckleberry pie getting special mention more than once. Soon afterwards an indoor baseball game was in full swing. The declining rays of the setting sun were sifting softly through the trees when the last of the foresters' party piled in cars and hit the trail for Moscow.

THE FIRE GUARD TRAINING CAMP

FLOYD L. OTTER

In two ways the student Fire Guard Camp this year was different from those held other years; and in at least three particulars it was typical. The two ways were: first, Assistant Regional Forester W. W. White, was there from Missoula; and second, nobody got lost. Among those points which made it similar were: not all the smoke-chasers found the fires; there were enough fire-fighters on the practice fire to eat it; and—*it rained.*

Nineteen first and second year foresters left Moscow Thursday afternoon, May 14, and arrived at Cedar Camp on the Palouse Division of the St. Joe National Forest in time to make camp before dark. By eight o'clock the flames of a dozen "Injun" fires lit up the campfire scenes where faces showed all the gastronomic stages from the half-starved look which comes just before the spuds are done, to that satisfied expression which is the label on the container of a square meal.

By six o'clock the next morning open-air kitchens were again going full blast with the air full of flapjacks and the aroma of the bacon. Each man checked out a fire-pack that morning and work was begun at the lookout with Ranger W. H. Daugs of Princeton, Idaho, Assistant Supervisor Hillman of St. Maries, and the writer, as instructors at three lookout boards. Practice in use of the smoke chaser's compass was secured by finding hidden cards in the woods, but the real tests came in the afternoon when two "smokes" were discovered a few miles away. Each man went alone to find one of the fires and eleven succeeded. It was a stiff test of woodsmanship. Joe Farber and Robert Kellogg made the fastest time and were the only men who found fire number two.

After dark a "snipe hunt" was organized to test the ability of each student to locate fires at night by means of a compass and "Palouser." Ninety per cent of the embryo smoke chasers found the lighted lanterns which had been hidden in the woods. The starting point looked like a group of star-gazers and the mountain side seemed covered with enormous flitting lightning bugs. One man thought he heard a bear, but he was recaptured—(the man, not the bear).

Saturday was occupied by instruction in putting out fires, in telephone line work and by seeking shelter from rain. At 5:00 p.m. the students broke camp and headed for Moscow via the University truck, "Aphrodide Godiva" (Erickson's open air taxi), muddy roads, Harvard and Princeton.

There was no doubt in the minds of the trainees, the writer believes, that intensive training pays. Thanks are due to Ranger Daugs for supplying intensive smoke-chasing practice, to Mr. Hillman for his time and effective instruction, and to Mr. White for his inspiration and his fire-fighting kinks.

Those present were: Tom Adams, Fred Baldridge, Lloyd Burnett, William Cline, Wilfred Dresskell, Maurice Erickson, Joe Farber, William Featherstone, Lloyd Hayes, Paul Ingebretsen, E. C. Jensen, Robert Kellogg, Maurice March, James McCall, Henry McCormick, Ben McKinnon, James Milner, Merrill Thornber, and John Ward.

MOTION PICTURES SHOWN TO STUDENTS

To supplement the instructional courses in logging, lumbering, and fire protection, the School of Forestry secured a large number of reels of motion pictures for showing to forestry students. Visitors were also invited to see the pictures. Early in the fall, the Caterpillar Tractor Company, provided an interesting series of pictures showing various means of using "cats" in logging and lumbering. The Lidgerwood Company loaned the School five reels of logging films for showing January 15. On February 17 five more reels were shown, two of which were obtained from the Long Bell Lumber Company and three from the Caterpillar Tractor Company. Several films on fire protection obtained from the U. S. Forest Service were shown April 13.

PECHANEC ELECTED PRESIDENT

Joseph Pechanec, a junior in the School of Forestry was elected on May 18 to be the president of the Associated Foresters for the school year 1931-32. Pechanec plans to remain in Moscow this summer attending summer school and carrying on forest research so will have the Associated Foresters' activities well lined up for next year by early September. Other officers elected are: vice-president, Warren Ensign; secretary-treasurer, Charles Fifield; and Ranger, Fred Baldridge. At this meeting too freshman foresters were awarded the silver loving cup for winning the barbecue. The barbecue is mentioned elsewhere in this publication.

AN OCCUPATIONAL STUDY OF GRADUATES IN FORESTRY FROM THE UNIVERSITY OF IDAHO

F. G. MILLER

Incident to filling out various questionnaires for the Forest Education Inquiry now being conducted under the auspices of the Society of American Foresters, an occupational study was made of the graduates in forestry from the University of Idaho, the results of which it is thought will be of interest to readers of the Idaho Forester.

It will be noted that the table given below covers the period from September, 1909, the date when the School of Forestry was first opened, to September, 1930. The table shows that of the 103 living graduates to September, 1930, 81 or 79 per cent are still engaged in some phase of forestry work. This is a high percentage as compared with the percentage of men graduating in other professions to remain in the fields for which they were directly prepared.

Of the 74 men receiving only the bachelor degree, 70 per cent are still in forestry work, while of the 29 taking the master's degree either at the University of Idaho or elsewhere, 100 per cent are still engaged in work connected with forestry. The larger percentage of master degree men than those taking only the bachelor degree remaining in forestry is doubtless due to the fact that men are reasonably sure that they want forestry as a permanent objective before they decide to take advanced work in it.

Of the 81 graduates remaining in forestry, it will be noted that 65 per cent are with the federal government. Most of these are in the Forest Service, though the Indian Service and the Biological Survey each claims a few. Twenty per cent are in the employ of private lumber companies, 6 per cent are on faculties of forest schools, 5 per cent are in the service of foreign countries, while 2 per cent are employed as state extension foresters and 2 per cent are doing postgraduate work.

TABLE I

OCCUPATION OF LIVING GRADUATES IN FORESTRY

UNIVERSITY OF IDAHO

September, 1909 to September, 1930

All Graduates

	Master's degrees at U. of I. or elsewhere		Bachelor's degree at U. of I.		Total	
Line of work	Number	Per cent	Number	Per cent	Number	Per cent
Forestry	29	100	52	70	81	79
Other	0	0	22	30	22	21
Toatl	29	100	74	100	103	100
Graduates remaining in forestry						
Federal	17	59	35	67	52	65
Private	3	10	13	25	16	20
Teaching	3	10	2	4	5	6
State	1	4	1	2	2	2
Postgraduate	2	7	0	0	2	2
Foreign	3	10	1	2	4	5
Total	29	100	52	100	81	100

CALIFORNIAN PAYS SCHOOL A VISIT

Professor Walter Mulford, head of the division of forestry, college of agriculture, University of California, visited the Idaho School of Forestry on Monday, January 26, 1931. He was entertained at lunch by the forest faculty. Professor Mulford was on his way back to California after a several weeks' trip to the southern and eastern part of the United States.

SPOKANE FIELD TRIP

March 25 and 26 ten members of the class in Seasoning and Preservation of Wood, went to Spokane to study the wood preserving plants there. The pole treating plant at Yardley and the Washington Wood Preserving Company's pressure plant at Hillyard were studied in some detail. Spare time was spent at the Inland Empire Paper Company Mill at Millwood and in attendance at the meetings of the Western Forestry and Conservation Association and Fire Equipment Show.

SOME MEDICINAL USES OF BARK

(Continued from page 33)

that have died. The final uprooting of the stand is made about the tenth year. It has been found that the rotation which gives the greatest return in quinine per unit of area is about 8 to 10 years.

In locating suitable areas for growing this tree, sample plots of from one to ten acres are planted, properly attended and in three to four years they will serve to indicate the quality of the locality.

The importance of this forestry practice to the British Empire is appreciated when one learns that in India alone, in an ordinary year, some 1,300,000 people die of malaria. It has been estimated for India that the lowest amount of quinine per year which would have any effect upon the malaria problem would be about 970,000 pounds. Quinine sells wholesale at about $6.00 per pound.

A pathological exudation from bark tissue of which we are all familiar is gum acacia, also known as gum arabic. Quantities of this gum are used in the production of medicinal products, adhesive pastes, candies, and many other products. The range of the acacia tree is along the upper Nile River in Egypt and also in Asia. It attains a height of 20 feet and is found in sandy soils or deserts, often forming entire forests with little or no associated vegetation.

For one week in March 1930 the importations into the United States at the New York port amounted to about 170,000 pounds. Gum acacia is sold by grade, based on color and freedom from foreign matter, and the grades range in price from 15 to 40 cents per pound, in bags of 100 pounds (wholesale).

In closing this short article on a broad subject I wish to emphasize the fact that a great many of our medicinal products are caused by pathological disturbances in tree barks. The natives in some cases have found that they can increase the yield of such exudations by bruising the bark, and one example of this is in the production of styrax.

The cultivation of trees for medicinal uses is an enterprise *not unrelated* to the practice of forestry, and the time has arrived when more interest is being shown in this field.

WHEN A SPADE IS A SPADE

Forestry student from Boston: "Look at the pity boid in the tree."

Forestry student from the West: "That ain't a boid, that's a bird."

First: "Shore it's a boid."

Second: "I didn't say boid, I said bird."

First: "Well, it choips like a boid."

BLISTER RUST CONTROL CAMPAIGN

Realizing that invasion of Idaho's great white pine stands by the blister rust menace was inevitable, the Office of Blister Rust Control at Washington, D.C., several years ago, began experimental work in methods of control in order to be ready for large scale methods which it was known must be inaugurated later.

The disease was found in Idaho in 1928, but it was thought to be spreading so gradually as to give no immediate alarm, until the fall of 1930 when it was found that it was already so thoroughly established as to cause incalculable damage unless adequate control measures were undertaken immediately.

A ten year program was set up at once. Congress and the Idaho legislature appropriated sufficient funds which, together with liberal contributions from private owners, have made it possible to put upwards of seven hundred men on control measures this summer. The work this season is concentrated in the Clearwater region and will be carried to other regions from year to year until at least the heavier white pine stands are safeguarded. The campaign will be carried on under the joint supervision of the Office of Blister Rust Control at Spokane, and the Forest Service.

FACULTY MEMBER PUBLISHES BOOK

"Outline of Forest Pathology" is the name of the textbook which will appear about the middle of June this spring from the pen of Dr. E. E. Hubert, professor of forestry of the Idaho School of Forestry. Dr. Hubert is well qualified to write a book of this kind. He spent five years at the Forest Products Laboratory, Madison, Wisconsin, in pathological work before coming to Idaho, besides carrying on considerable other investigative work in this field for the U. S. Forest Service elsewhere over the United States.

The book will contain about 600 pages and carry 160 illustrations. It is divided into two sections: 1. Diseases of all living trees; and 2. Defects of wood and wood products. The work covers the principles and practices of forest pathology in the United States but is general enough so that it may also be applicable to forest conditions in Canada. It includes data on wood and wood products and the scope of the information should be of interest to those who handle and manufacture wood in all forms. John Wiley & Sons Inc. of New York City are the publishers.

SPECIFIC GRAVITY OF THE FIRS

(Continued from page 38)

Conclusions

Table I summarizes completely the results of the specific gravity tests. Final average specific gravities are given for each species.

The influence of annual rings per inch on specific gravity is very distinct. The amount of summer wood present seems to be a good indicator of specific gravity. Since strength is directly correlated with specific gravity, a study of this property in the true firs may aid in the selection of species, according to their strength values, which are suited for general use as construction timbers, box shooks, crates, studs, joists, concrete forms, roof boards, rafters, sub-flooring, and many other uses.

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THE RELATION OF BARK THICKNESS TO THE DIAMETER OF WESTERN YELLOW PINE

(Continued from page 39)

structure outside of the phellogen layer or that part of the stem outside of the cambium layer, the latter meaning was adopted and the scale was inserted into the hole to that depth. Also, care was taken to bore all trees on the side facing the east, thus eliminating any possible variables resulting from climatic conditions.

Office Work

The data thus obtained in the field were arranged in the office on small cards to facilitate ease and simplicity of handling it, each tree being assigned to a card. Then, by arranging the trees listed on these cards into one-inch classes, it was a simple process to obtain the average bark thickness and diameter for each class by arithmetical means. These values were then plotted on ordinary graph paper and a harmonized curve obtained.

Discussion and Summary

Until a larger amount of work has been done on different sites and regions, no sweeping statements can be made about the relation of bark thickness to diameter of western yellow pine. As would ordinarily be expected, the thickness of bark increases with the diameter of the tree, but it was found that this relation is not directly proportional to the increase in diameter for all the diameters. For trees between nine inches and 11 inches d.b.h. the rate of growth in bark thickness was greater than the diameter growth, while for trees between 12 inches and 21 inches in diameter, the growth in bark thickness is practically in direct proportion to the diameter growth.

For western yellow pine trees above 21 inches d.b.h., the diameter growth was greater than the corresponding bark increase. The limits of this study do not include data for explaining the reason for this difference, but it is apparent, in part at least, that a large portion of this difference is due to the sloughing off of the bark of trees of these larger diameters. It was noted in the field that bark scales were especially plentiful at the bases of the larger and more mature trees.

List of Citations

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WHERE DO WE GO FROM HERE

(Continued from page 6)

The problem thus appears to be a determination of what measure short of complete tax and protection cost exemption will enable owners of forest lands to hold and protect their lands permanently. The Reforestation Law is an important initial step toward this end. It reduces taxes on forest land during the non-revenue producing period to about 5 cents per acre. It does not affect the protection cost. Fifteen states are solving their problem by a general state levy. What would this mean in Idaho? The total estimated protection cost for the whole State is $447,000. The total assessed valuation is about $480,000,000. A levy of something less than 1 mill, depending upon the amount of Clarke-McNary money available, and the additional patrol carried by owner-operator lumbermen, would pay the whole bill. Is not this the permanent answer and should not every effort be applied to attain this ultimate objective?

Disposal of slash is the second fundamental consideration and it constitutes a problem because of the failure of general acceptance and application. Opposition to slash disposal, controlled to a point that the residual stand and young growth is undamaged, as a protective measure, is largely confined to those operators who have not applied the necessary means to successfully accomplish the desired end. Immediate cost has been the real reason for the opposition though sometimes it has been disguised. Secondary savings in cost, if truly and completely determined, might well offset the total original slash disposal cost. The problem is thus one of demonstration. It is certain that if safe slash removal were necessary to get logs out of the woods the same ingenuity would have been applied to slash disposal that has been applied to every phase of logging, with the result that costs would have been cut and accomplishment would have been complete. In a region where "selective logging" is the rule there is no doubt that slash disposal following the first cut aids materially in logging the second or third cut. Add to this the reduction in protection costs occasioned by lower hazard and there is a tangible benefit of no small proportions. Few, if any, operators have relinquished their benefits once appreciated. Successful demonstration will gain more and more supporters until safe slash disposal will become a more generally accepted fact.

Third and last we must accept the fact of our relatively high fire control cost but we may also adopt measures which will tend to reduce it. It is no doubt true that Idaho has inherently the highest cost in the United States but it has been far too high. There are unnecessary fires, there are violations of rules of common prudence, there are still insufficient protective forces. The application of the existing knowledge based on experience in these matters through the existing agencies will accomplish the ends of cost reduction.

We now have two years before the next legislative session to work a change from apathy or worse to interest and action; to determine what problems pertain solely to administration and better that function; and what difficulties must be solved by amendments in legislation. There is competent authority to do these things. May we, therefore, start from here and know by diligent, coordinated, intelligent effort, where we are going.

MAINS VISITS SCHOOL OF FORESTRY

Mr. Guy B. Mains, Forest Supervisor of the Boise National Forest with headquarters at Boise, appeared before the Idaho School of Forestry student body Monday, March 23, and gave a series of two lectures. His first lecture, entitled "How White Pine Came to Idaho", was a humorous address involving the all-American mythical logger —Paul Bunyan, and the answer to the centuries' old secret was satisfactorily answered for the first time.

In his second address, Mr. Mains described in detail research problems in southern Idaho which deal particularly with soil erosion and flood control. He discussed various phases of these problems, such as the influence of rodents, forage and timber cover. Mr. Mains was on his way to Boise from attending the Western Forestry and Conservation Association meeting which was held in Spokane the previous week. He is by no means a stranger to the Idaho School of Forestry and has always been very liberal in his lectures to the forestry students.

Give fools their gold, and knaves their power;
Let fortune's bubbles rise and fall;
Who sows a field, or trains a flower,
Or plants a tree, is more than all.

—Whittier.

Pa Trolman Says:
"Got my fire pump set up right at the fire—when I finally got her going, the fire had left. 'Sall right anyhow, there w'ant no water around."

THE FOREST SURVEY

(Continued from page 21)

broad groups—lands within the national forest boundaries and lands outside of the national forests. The field work necessary to complete the data for the national forests is handled by a man detailed to each forest, usually one of the men permanently assigned there who could be spared for this task. These men are supervised from the forest survey office and some of them are paid from forest survey funds.

Their methods and instructions are practically identical with those governing the work outside of the national forests, but with such added refinements as were thought advisable for the making of management plans, or other administrative purposes. These consisted primarily of segregating the data by logging units. These men made use of existing timber surveys and covered the remaining area by sketching the types and determining volume by ocular estimate. The information on alienated lands was furnished, where it existed, by the forest survey office, otherwise it was obtained by field work.

Private Lands

The county was made the working unit for lands outside the national forests. For administrative purposes and to best use the knowledge of local conditions already acquired, together with the personal contacts established in that part of the state, a group of counties is assigned to one field examiner. These groups of counties correspond to the tentative units in which it is planned to release the information.

Before taking an assignment, the field examiner assembles the information already obtained from office records and upon the basis of this knowledge plans the work. Using these data as a framework, an attempt is made to cover the blank area by inquiry, and if this information is not forthcoming or appears to be unreliable, field work is resorted to. Before going into the field the examiner delineates upon transparent overlay sheets all type data available for that particular township. This overlay is superimposed upon a base map which consists of a township plat showing all drainage and cultural features. The scale used for field mapping is one inch to the mile and forty acres is the smallest type area recognized. The type boundaries are drawn upon the vellum overlay sheet and enclose the symbols designating species, age and degree of stocking. Age is shown to the nearest ten-year class. Three classes of stocking are recognized: good, medium, and poor. These are symbolized by a system of horizontal bars. The degree of stocking is determined by ocular estimate and the occasional counting of sample plots.

It is sometimes impossible to tell from casual inspection whether an area is restocking, and if so the degree of such restocking. Transects are then run and the reproduction found in a system of squares laid out at one chain intervals is recorded. The degree of stocking is then determined from the number of squares in which a young tree was found.

When merchantable, the board foot volume of all types mapped in place is estimated and recorded on a section assembly sheet. The exception to this is Douglas fir types less than 150 years old where volume can be obtained by the use of yield tables since the site, age and degree of stocking are shown.

Field examiners find opportunity to check many of the areas mapped from office records. If found to be erroneous these are allocated to the proper type. When mapping in place the route covered is indicated on the base map by a red line with circles at points where extensive sketching is done.

Agricultural Lands

In such a study some recognition must be given the farm woodlot for while individually these are of small importance, in the aggregate they total a very appreciable volume.

It is impractical to map in place the small scattered areas of forest type found throughout the agricultural zone so these areas are stripped and the data obtained by statistical methods. Any area approximating half a township where agriculture is the predominating use with fifty per cent or more of the land cleared or in stump pasture is called an agricultural zone.

Agricultural areas are the last part of the field work to be undertaken. The boundaries have then become defined by the types mapped in place and the problem of stripping can be effectively planned. The transects or strips are run three miles apart and in the cardinal direction best suited to give a representative cross section of that locality. Normally these strips are one and one-half miles from the township line and parallel with it. Agricultural areas less than half a township in size are mapped in place.

A form was devised for recording the data secured from these transects. It consists of a line of dots drawn to scale and numbered upon which is marked the type boundaries as they are cut by the transect. The data taken are merely a record of the distance through each type, and for the

timber types the average volume per acre, site, stocking and age.

The procedure consists simply of recording the cadastral location of the starting point, keeping the direction by compass and pacing to determine the distance through the type. Fence lines and roads enable the pacing to be checked at frequent intervals.

Release of Data

When all the inventory data are collected, compiled and assembled they will be presented in the form of statistics as to acreage of types and volumes by species in both board and cubic feet by whatever areas are finally decided to best serve the purpose. This may be individual counties or groups of counties which form natural economic units. In addition to this statistical presentation, a colored type map of the region at a scale of four miles to the inch will also be prepared. On a map of this scale it may be necessary to combine some of the finer detail collected in the field into broader types so as not to clutter up the map with minute type areas. Tentative plans have been drawn up for the growth and depletion phases and it is expected that these phases will be completed simultaneously with the inventory phase or else shortly thereafter.

JUNIORS ON ANNUAL FIELD TRIP

While this edition of the Idaho Forester is going to press, the Junior Class is visiting the Northern Rocky Mountain Forest Experiment Station at Priest River, Idaho. This annual field trip covers a period of two weeks during which time the Juniors become acquainted with field technique of forest investigations, study Forest Service and State timber sales, and establish and prepare sample thinning plots, besides become familiar with numerous other phases of forestry practices and research.

The group left Moscow May 24 and plan to return June 6, just in time for Commencement. Those making the trip are: Leonard Anderson, Paul Aust, Harold Brown, Melvin Coonrod, Warren Ensign, Gunner Fagerlund, Charles Fifield, Jack Hume, Robert B. Johnson, Philip Lord, Paul Martin, Earl Morganroth, Joseph Pechanec, Horace Richards, Allen Swayne, Jesse Hopkins, and C. N. Taylor. The trip is made under the supervision of Dean F. G. Miller, A. M. Sowder and George Jemison.

The proximity of the Northern Rocky Mountain Forest Experiment Station to Moscow is a very valuable asset to the Idaho School of Forestry. The trip to the Station is but little more than a half day's drive from Moscow by automobile.

FORESTRY EXHIBITS AT IDAHO FAIRS

The School of Forestry prepared a forestry exhibit which was joined to the general University exhibit and shown last fall at the principal southern Idaho District Fairs including the Twin Falls County Fair and the Southwestern and Southeastern District Fairs at Boise and Blackfoot, respectively. The general University exhibit was divided into five units, each unit consisting of three panels, each panel being four by seven feet in size. One panel was used for the background and the two others formed wings. The general exhibit brought forth a great deal of favorable comment and much praise was given the forestry unit exhibit in particular.

A colored lighted transparency showing the Half Moon forest fire in Montana caught the eye of the audience to the forestry exhibit. Attention was then directed to general data on the forests and the lumber industry of the State, to specimens of principal Idaho woods, by-products from our forests such as artificial silks, naval stores, etc. The process of manufacturing rayon was shown step by step from the wood to the finished garment. When the general exhibit was returned to the University it was set up in the Administration Building for the benefit of the University students, faculty and townspeople. It is planned to continue this method of advertising the various departments of the University over the State.

FORESTERS ENTERTAIN MAJOR KELLEY

Major Evan W. Kelley, Regional Forester from Missoula, Montana, was entertained at a banquet given by the Associated Foresters at the Blue Bucket Inn the evening of December 4th. George Jemison, president of the foresters was chairman and during the evening called on Major Kelley for a talk. Major Kelley's topic was "Trends of Forestry" and he emphasized his points by citing observations he has made. Major Kelley anticipated considerable more acquisition of lands by the federal government in the near future and felt that one phase of the forest profession coming to the front is that of recreational resources.

WHITE PINE PRODUCTION AND BLISTER RUST CONTROL

(Continued from page 15)

control is likely to be more economical than for any other major forest disease. In fact, from the viewpoint of commercial forest production, the blister rust is the only important forest tree disease that has thus far been controlled on a practical basis.

Cost of initial control work varies directly with the abundance of Ribes plants and to a considerable extent with the cover and topography of the ground. Maintenance costs will be influenced by these same factors, but repetition of Ribes eradication in years subsequent to the initial work will depend to a considerable degree on forest management practices. In the stream type in the Inland Empire region, growth conditions for Ribes remain favorable for Ribes reproduction from seed and, in so far as we now know, such areas will need reworking at fairly frequent intervals. Probably after the Ribes have been systematically cleared from the stream types several times, Ribes seed production will be so materially reduced as to make effective maintenance work possible at low costs. It may also be possible to permanently crowd out regrowth of Ribes in this type by encouraging the growth of other plants.

Natural factors of control exert an important influence within the upland forested sites. Most of the Ribes plants require sunlight for their best growth, and cannot survive under strong competition from forest trees. The age and density of the forest stand are factors governing the abundance and rate of growth of Ribes. The Ribes plants come in thickly and thrive on newly denuded forest areas such as are caused by broadcast burning or clean cutting. They mature quickly and produce fruits abundantly before the young forest trees attain sufficient size to inhibit the development of the Ribes. As the forest growth progresses, further establishment of seedling Ribes is prevented, and the established bushes on such sites become weak and gradually die out. This process as it occurs in Nature is, of course, slow and incomplete, and while it does not generally make Ribes eradication work unnecessary, it tends to set up an effective barrier against the regrowth of Ribes after forested areas have been systematically cleared of Ribes. It also offers opportunity to reduce cost of rust control through a system of forest management that does not destroy the ground cover.

In attacking the problem of Ribes eradication work in the Inland Empire, we find a wide range of costs varying to a large extent inversely with the age of the forest stand. In well stocked stands, costs will be highest in the reproduction stands and lowest in the mature stand. The average per acre cost in any block or drainage will be governed by the ratio of the different types. The stream type is the most expensive type encountered. Reproduction stands, pole stands, and mature stands come in that order of descending costs.

A highly encouraging feature of the situation as it relates to cost and speed of Ribes eradication is the success attained in destroying concentrations of Ribes by means of chemical sprays. The outlook is bright for further reduction in control costs by chemical means, as well as by improvements in manual methods of eradicating Ribes. What the costs will be per acre of protected pine in the West will depend upon the size of the control areas. To protect a single acre of pine with a protective zone one-fifth mile in width, necessitates clearing Ribes from 122 acres additional; that is the cost of the protection zone is 122 times that of eradicating Ribes on the acre of protected pine. If a control area of 4 townships is protected by a zone 1/5 mile in width, the cost of the work in the protection zone is only one-fourteenth of the cost on the protected acreage, or 7 per cent additional.

It is clear that low cost of control is dependent upon large continuous tracts to which control is applied, since a Ribes-free protective zone around the pine is necessary and only on large areas will the extra cost of the protective zone become a negligible factor. Another reason why control must be applied in large, continuous tracts, at least for the present, lies in the fact that western white pine is much more readily attacked by the rust than is northern white pine, and the concentration of Ribes in the stream-type probably will cause heavy damage to western white pine stands of all ages within a half mile radius of such concentrations, and possibly farther. Obviously, control work must be done very systematically, and rigid standards of efficiency maintained. Furthermore the rust is now so well established in the Inland Empire region that we may look for a very rapid increase in the area and degree of infected pines in each succeeding year. Hence the Ribes eradication work must be done as rapidly as possible in order to cover the ground ahead of heavy development of the rust in those areas where the pines are to be safeguarded from disaster.

The rust is here to stay, hence the present pioneering work in its control should be greatly improved upon as experience is gained. This progress, with consequent reduction in cost of control

and maintenance of effectiveness in control, depends upon a scientific approach to the practical problems. One means of doing this is through a limited amount of research and field investigation done in connection with the practical field work. Another means lies in the practical work itself, through systematic recording and analysis of data relating to the work, so that improvements may be measured when the ground is reworked, thus effecting savings by utilizing the maps and data developed in the initial work.

The public has so long held white pine wood in high esteem that the fungous and insect enemies of the commerical five-leaved pine species have come to public attention to a greater extent than is the case with the enemies of most commercial timber trees. Hence, one frequently reads that white pine is the preferred species for growing on a certain site, but a substitute species is recommended because it has fewer enemies than white pine.

Fifteen years of systematic control effort demonstrates that the blister rust offers little handicap to the production of northern white pine on 95 per cent of its sites. The charge for blister rust control should not exceed $1.00 per thousand feet of lumber produced and in most cases will be only 5 to 10 cents per M. feet, especially if attention is given to the matter of keeping the area fully productive by ample stocking.

If a white pine production program is mapped out wherein the sites are chosen for suitability to this purpose, there will be no difficulty in producing white pine in adequate quantity in profitable competition with other species. Obviously, it will pay to apply simple measures for improving the stands as well as to protect them. Under a systematic program of white pine culture we can assure that the most favorable white pine sites are occupied by this species, with low control costs. It will pay to grow white pine under these circumstances, if it pays to grow any timber species.

The whole situation as it relates to the future of commercial white pine production must be intelligently thought out. This requires accurate data to show where we stand with regard to these important species, not overlooking the facts required from the standpoint of applying blister rust protection. Fortunately, foresters and lumbermen will soon have these facts available through the agency of the Forest Survey. Forestry planning is the basis for successful development of forestry in America.

RANGE MANAGEMENT AS A FIELD IN FORESTRY

(Continued from page 11)

volved is on the forest land. There is room in the schools for the teaching of more range management to the student who is specializing in animal husbandry. However, the range management training will be the same whether taught from the point of view of animal husbandry or that of land utilization.

The future outlook for range management as a field in forestry, therefore, appears fairly optimistic. However, it will not grow by leaps and bounds for in a considerable measure the field must be built up and it is no small part of the job of those who enter it to build the field as there is a need for it.

THE UTILIZATION OF ABANDONED LOGGING RAILROAD GRADES IN A FIRE PROTECTION SCHEME

(Continued from page 28)

After the roads are completed they are mapped and placed on the Fire Dispatchers map at the central office at Klamath Agency. Each road is numbered on the map. Sign boards are made and placed along the roads bearing the number of the road on the fire dispatchers map and each sign bears a small map of the section showing the location of the road. The Fire Dispatcher directs the men to a fire by the numbers of the roads they are to take in going to the fire.

Prior to opening up these roads there was an elapsed time from the first report of the fire until men were fighting it of approximately 3 hours and after the roads were opened up and the system placed into effect it was found to be possible to place men at any point within the area in an hour's time.

CITY WEARY

I want a hut, strong-walled of mountain logs,
And builded on gray stones that once were stars—
A hut with sunrise windows wide and tall,
And giving view of wind-lashed black-spruce spars.
I want an open hearth of pitch-pine knots
On hearth of pebbles polished by a stream—
I want a couch of cedar where by night
I'll hear the rain—I want a chance to dream.

Stanley Foss Bartlett

INDUSTRIAL FORESTRY

(Continued from page 13)

acre, or $450.00. The average yearly taxes were $180.00 or a total of $3600.00, giving the following results.

	If Logged in 1930	20 Year Average
Loss on Timber	$4788.00	$1800.00
Protective Charges	450.00	450.00
Taxes	3600.00	3600.00
Total Loss	$8838.00	$5850.00

I believe this to be a typical example of the results that any individual or corporation would show if they were to make figures on purchases of Idaho white pine timber that were made 18 or 20 years ago.

There have been times, of course, during the past 20 years when stumpage was worth much more than it was in 1911 and considerably more than it was in 1930, but my experience convinces me that an average of from $5.50 to $6.00 per M for stumpage during this 20 year period would be reasonably high.

If the company had not had a lumber manufacturing operation in connection with its logging operation and had not had some years when we obtained reasonably high prices for our lumber, we would have shown an actual loss on all our timber purchases which we made in 1910 and 1911.

I want to say at this point also, that in logging our timber for many years past we have practiced a modified form of industrial forestry, as we have complied with the law as regards the piling and burning of brush following our logging operations. We have, of course, not cut the timber on a basis of sustained yield, but we have left the mixed (except such as was used for improvements) standing and in good shape to be harvested as a future crop.

Any one acquainted with the operations of lumbermen in our state will readily agree that much progress has been made by them in operating along forestry lines in the last 20 years. There is, of course, room for much improvement, but when one bears in mind that most of the men managing these operations got their first experiences in Michigan, Wisconsin and Minnesota at a time when timber was not considered a crop and before forestry was very much talked of, I think we will have to admit they have done very well indeed to progress to the point they have now reached in practicing forestry in carrying on their operations.

Too many of us, however, still feel as an old time Stillwater, Minnesota lumberman expressed himself when asked why he did not practice forestry and leave some of the small timber standing

for the use of posterity, when he remarked: "Posterity! Posterity! What the hell has posterity ever done for me?"

I have previously mentioned Mr. Walker's experience as an example of individual industrial forestry. Possibly, as our western country develops and becomes more densely populated, this kind of forestry can be carried on in certain localities by individuals, but the general character of our western timbered country certainly does not lend itself to this kind of individual industrial forestry, or to the harvesting of a crop by corporations along these lines. This, for the reason that the cost of making and maintaining the logging improvements is very high and all of the timber that it is profitable to take must be logged at the time the initial improvements are made.

The people of this state took a forward step in passing the Forestry Law of 1925. They made another important move in amending this law in 1929, giving owners of "Reforestation Lands" relief from taxation, but if our people really want to encourage industrial forestry and to have privately owned timber held for longer periods of time, they must relieve the owners of this timber from the excessive tax burden that is now imposed upon them. It is my judgment that nothing more constructive could be done to promote industrial forestry in this state than to reduce gradually from from year to year over a period of time the taxes that are now being collected on privately owned virgin forests, and I can't see how the state would suffer in any way if the law provided that a proper tax would be assessed when the timber was cut. I make the suggestion that this tax be reduced gradually from year to year, for I don't see how it could be done all at one time, but I do believe that it could be done over a period of years, as it would then give the different taxing units a chance to adjust their matters so they could provide for income from other sources.

HOPELESS

Two old backwoodsmen were sitting over their camp fire, hundreds of miles from civilization. No woman had ever set foot in that part of the country. The domestic arrangements were, as a result, crude in the extreme.

From politics and sport the conversation turned to cooking.

"I bought one o' them thar cookery books a few years ago," said the first old timer, "but I couldn't never make head nor tail of it."

His companion nodded. "Too much fancy work about it, I suppose?" he inquired.

"Yus," wheezed the first man. "You're right thar. Every one o' them recipes began just the same,—'Take a clean dish,'—it said. That o' course, settled me at once."—Anon.

PROBLEMS IN WOOD CHEMISTRY

(Continued from page 17)

lose molecule (probably the most abundant organic substance above the earth) may mean.

It is because of the magnitude of the problem that interest in wood chemistry research is growing. Nearly every issue of the important chemical journals of several countries contains an article on cellulose, lignin, or some phase of wood chemistry. The amount of speculation is still enormous and numerous polemics are constantly taking place in which the merits and faults of opposing theories are exposed. Such a situation is proof in itself that our knowledge of wood is largely in the formative stage in spite of the wealth of data already at our command.

Intense fascination for research may be developed in problems concerned with the chemical utilization of wood wastes and of the forest crop. Equally fascinating are problems dealing with the fundamental structure of wood and attempts to grasp a knowledge of the functions and mechanism of tree growth.

These fundamental studies in fact underlie the entire field of practical wood chemistry. What is the exact nature of cellulose, how is it synthesized in the plant, and how are the fiber crystallites produced in such regular orientation? What is lignin which makes up about 25-30% of all wood? What is the chemical nature of the resins, dyestuffs, tannins, and wood sugars, and what is their purpose in the tree? What is the relation between forest soils and tree growth? Our answers to these questions are as yet only fragmentary.

Pressing practical problems are equally numerous. How may we utilize this difficult-to-become-acquainted-with substance, lignin? The possibilities are many—dyes, explosives, spices, drugs, and industrial chemicals—but our knowledge is too limited. How may we dissolve or otherwise remove cellulose from wood (shavings and other wastes) without the first long and costly removal of lignin? How can we duplicate the natural strength and regularity of structure of the cellulose fiber in our artificial fibers? How may we convert wood into pulp for fiber boards, artificial lumber, molded products, etc. by less drastic, quicker and cheaper, means? How may sugar, alcohol and various industrial chemicals be produced from wood by hydrolysis or fermentation by economically practical processes? We know that the decomposition of cellulose and wood by alkalies leads to many valuable products. How may the process become an industrial fact? The same question holds for the destructive distillation of wood under pressure whereby large amounts of phenols, unsaturated hydrocarbons, and motor fuels may be obtained. How may fiber boards and other inflammable wood products be effectively and cheaply rendered waterproof and fireproof?

Furthermore, our present industries require constant research for more scientific processing and development of special uses for the products. An example is the wood distillation industry which a short time ago seemed surely doomed by the synthetic production of wood alcohol and acetic acid. However, experiments in Germany have indicated that charcoal production may be increased by about 80%, the yield of acetic acid trebled and that of wood alcohol doubled. Two new short cuts are being used in this country for the production of acetic acid and it is believed that through them the wood distillation industry can successfully meet synthetic competition provided energetic research is continued to develop new uses and grades of wood tar, oils, and charcoal.

At the Idaho School of Forestry problems of the nature of those enumerated above are being studied. Some of the problems now under investigation or which will be undertaken shortly, include the nature of various lignin derivatives, the adsorption of various substances (for waterproofing, fireproofing, etc.) by cellulose, the chemistry and utilization of various water soluble polysaccharides, the nature of different oils, resins, and oleoresins, the rates of adsorption and degree of affinity for water by different wood components and different wood species, and the investigation of new and cheaper methods for the conversion of wood wastes, etc. into pulp for fiber boards, artificial lumber, and molded products. Improvement in quality and extension of uses of fiber board and related products is being sought by studies on fireproofing, waterproofing, and increase in strength.

The wood chemistry laboratory is satisfactorily equipped and stocked to carry on research in cellulose and wood chemistry. During the coming summer the practical research equipment will be greatly augmented by the building of a new wood conversion laboratory. This laboratory will be equipped with digesters, autoclaves, a high pressure and vacuum cylinder, a large still and retort, extraction apparatus, a beater, ball mill, pulp screen, sheet-molds, and high pressure hot-presses and molding equipment. This semi-commercial apparatus will be designed to be as flexible as possible in order that it may be adapted to the needs of various problems.

NATURAL AND HUMAN FORCES IN FIRE CONTROL

(Continued from page 9)

cident to transfer of complete crews, outfits and camp units by pack mule, many fires have grown into major conflagrations.

Superimposed over these changes to speed up is the construction of a network of truck trails, supplemented by a few airplane landing fields for transport planes. When completed these improvements will bring the fire area within approximately 6 hours foot travel from the nearest road or landing field. The trail system will be completed in three years or thereabouts. Other great changes are under way to cut hours off elapsed time from inception to control. Fire prevention plans are also being rigorously pressed. Verily, failures in the future seems far less likely than in the past.

Summed up, in my judgment, the fire history of 1910, 1919, 1926 and even 1929 signifies but little more than what can happen again, but in view of the greatly extended physical plant and growth of knowledge, likely will not within limits approach similar proportions, provided executive management both within and without Federal Service, starting with fire prevention sees its job and does it reasonably well.

I have repeatedly mentioned "failures" with the object of focusing attention on the too widely overlooked fact that big fire losses are honestly chargeable as "acts of God" in but a surprising small percentage as long as the public and its organizations and private organizations profess determination to protect the forests against fire. A second purpose is to emphasize the fact that fire control is a tangible undertaking in which executive management has the same exact offices to perform as in all well administered industrial undertakings. This truth is too commonly overlooked in our U. S. A. Particularly is it necessary that the foresters of the future come to recognize the part they must take as executive managers if they are to do justice to their undertaking. And lastly, a bit of optimism about the possibilities of fire control in the Northwest may not be amiss at this time.

A COMPUTING HYPSOMETER PLATE FOR THE IMPROVED ABNEY LEVEL

(Continued from page 23)

but it develops the previously noted material advantages.

This plate may be adapted as it is to other uses. The following are but a few. In cruising timber it may be used to check the estimate of the number of logs for any given length of the bole. In the absence of a trailer tape or a topographic Abney this hypsometer plate will readily convert slope distances into their horizontal equivalents. In the laying out of sample plots this plate may be used to easily change a rectangle to a parallelogram equal in area. In the approximate determination of elevation above or below a known height in the case of fire or in location work when a contour map is not available, the plate will quickly measure and compute that value. It may also be used to determine per cent of slope in the absence of a per cent scale when the gradient exceeds 17 per cent. Furthermore, the hypsometer plate may be provided on the reverse side with one of the other standard Abney scales, thus making it even more useful.

In connection with these improvements of the Abney hypsometer, a new bracket staff mounting was devised. It is fastened to an extended king bolt by a friction washer and nut. It never can interfere with the free manipulation of the level bulb and the indicator arm nor with any angle reading. The standard ball and socket joint of the Forest Service compass may be screwed to this bracket support. Its claim of advantage over a ball and socket mounting fastened to the barrel of the Abney level lies in the fact that it is attached to the instrumental pivot instead and, therefore, does not introduce new instrumental errors when that is of importance.

Finally, the computing hypsometer plate mounted on the improved Abney level embodies measuring and computational short cuts in one simple, compact and stout field unit.

It is very portable yet measures all tree heights requiring the use of an instrument. It does this with a reasonable degree of accuracy though it does not demand of the user special skill and care in its manipulation. It has been found workable in all kinds of weather without losing the simple and quick adjustments inherent to the Abney. Although the distance from the tree to the observer always must be measured, horizontal or specific distances are not required. And, field calculations eliminate all office work, effect a slight increase in effective field time and produce a strong and reliable height curve.

DIRECTORY AND ACTIVITIES OF ALUMNI AND FORMER STUDENTS

FLOYD L. OTTER, '29

Ahlskog, Ralph H., Ex-'33, Coeur d'Alene, Idaho. Ralph was a recent visitor at the School of Forestry. He has been out this year earning funds with which to return in September.

Anderson, Bernard A., M. S. (For.) '28, 618 Realty Building, Spokane, Washington. "Andy" is back from his trip to the land of treeless hills and beautiful Senoritas. He was a campus visitor recently and reported a very enjoyable time in Europe, but seemed especially fond of Spain. He is Junior Forester with the Office of Blister Rust Control. "Andy" also announced his marriage to Miss Ethel Mellon of Spokane on Febraury 16.

Axtell, Don, Ex-'29, c/o Clearwater Timber Company, Lewiston, Idaho. Don is employed in the shipping department of the Clearwater Timber Company. He helped show the lumbering class through the mill this spring.

Balch, Prentice, '29, St. Anthony, Idaho. "Bones" is Junior Forester on tie sale work, which he describes as stamping ties, grading ties, cussing tie-hacks, and writing reports. We wish him luck and a large vocabulary.

Baird, John, Ex-'27, c/o U. S. Forest Service, Pagosa Springs, Colorado.

Bartlett, Stanley Foss, Ranger 1920-22, Lockes Mills, Maine. Bartlett says he has followed the country downward from lookout to the pulp woods and then from pulpwood to the finished newspaper. He is assistant editor of the Lewiston Sun-Journal and wishes he were back on a lookout. He has been a regular contributor of forestry verse to the Idaho Forester and this issue carries some of his latest poems. We need more contributions from others of the Idaho foresters.

Bartels, Harry E., Ranger '28, Box 11, Fort Apache, Arizona.

Baumann, Herman, '24, Susanville, California. Baumann is with the Fruit Growers Supply Company of Susanville in the capacity of Woods Superintendent. He is married and has one daughter.

Beals, Wilfred F., '27, Lauzon, South Dakota. Beals is District Ranger on the Harney National Forest. He says he sees Galen Pike occasionally.

Bedwell, J. L., '20; M. S. Oregon State '24, Office of Forest Pathology, Washington, D. C. Bedwell has completed his work in residence toward his doctorate degree at Yale Forest School, and is now with the Office of Forest Pathology, United States Department of Agriculture, as associate pathologist. His assignment includes all of eastern United States, where he is examining experimental plantations of Asiatic chestnut. He has many words of praise for Yale University, its Forest School, and the Forest School faculty.

Bennett, Carey H., '29, Bureau of Biological Survey, Washington, D. C. "Shorty" is doing appraisal work on lands for federal migratory bird refuges.

Bolles, W. H., '26; M. F. Yale '29, Lewis Building, Portland, Oregon. Warren is now Assistant Forester with the National Forest Survey in the Pacific Northwest. He spent his annual vacation on a tour of Alaska visiting the national forests. Warren is a contributor to this issue of the Idaho Forester.

Buchanan, T. S., is on leave this year to accept a position in the Office of Forest Pathology, Bureau of Plant Industry, Portland, Oregon. He is assigned to British Columbia for the field season and expects to return to school next September.

Buckingham, Art, '30, Challis, Idaho. "Buck" is a new addition to the alumni and a new addition to the Challis National Forest. He is making good as Forest Ranger engaged at present, he reports, on a game study on the Middle Fork of Salmon River. I suppose if there were any wilder spot in the United States, "Buck" would be there. "Buck" took the Junior Range Examination the spring of 1930 and ranked number one for the entire United States.

Burroughs, I. C., '27; M. F. Yale '28, Texas Forest Service, Lufkin, Texas. "Ike" is assistant State Forester of Texas. He evidently enjoys his work, which is in the Division of Forest Protection. The Division protects over 8,000,000 acres of longleaf, shortleaf, and loblolly pine and some hardwoods. He likes the country and the climate fine, but not so well as old Idaho.

Burton, Leslie, '30, U. S. Forest Service, Denver, Colorado. Leslie is Junior Forester on the Colorado and Routt National Forests. He has been getting varied timber sales experience. Before Christmas he, among others including "Spike" Gregory, was on the Christmas tree job near Denver. During the late winter he was on timber sale work on the Colorado and Routt Na-

tional Forests, and in May he was detailed to the Region 2 Ranger School.

Chamberlain, Fred B., 59 Albert Street, Melrose, Massachusetts. Chamberlain is still in the wholesale lumber business in Boston, dealing in western woods entirely. The company has three distributing yards in New England, selling only to retailers.

Cochran, Allan R., '28; M. F. Yale '30, is District Ranger in the White Mountain National Forest and is located at Littleton, New Hampshire. He was graduated, *cum laude*, from Yale Forest School in June, 1930.

Cochrell, Albert N., Ranger '22, U.S.F.S. Newport, Washington. Cochrell is Assistant Forest Supervisor on the Kaniksu National Forest.

Connaughton, Charles, '28, Forest Service, Ogden, Utah. Connaughton has recently been transferred to the Intermountain Forest and Range Experiment Station with a substantial increase in salary. He was a visitor at the school for a day in April.

Cozier, S. Edwin, Ranger, '26, Wyoming National Forest, Werna, Wyoming.

Cranston, William V., c/o English Lumber Company, Mt. Vernon, Washington. "Bill" is purchasing agent for the English Lumber Company. He is the proud father of a son, Allen Garnett, upon which we congratulate him. He summered on a lookout on the Mt. Baker Forest last summer, but wished it had been Bear Creek on the Selway.

de la Cruz, Eugenio, '26; M.F. Yale '27, 1214 Miguelin Street, Sampaloc, Manila, P. I. Cruz has recently been promoted from the Division of Lands and Maps, to Assistant Chief of Division of Forest Lands and Regulations. He is the father of two children.

Cummings, Lewis A., '25; M.F. Yale '29, South Fork, Colorado. Cummings is District Ranger on the Rio Grande National Forest. His district will be the center of operations for the International Paper Company Timber Sale if it goes through as planned. This sale of 60,000 cords a year will be the first large pulpwood sale in the Intermountain region. Cummings was detailed to fight fire in Michigan last summer. He reports effective use of 10,000 gallon tank cars for fire-fighting.

Cunningham, R. N., '17, has been promoted to the position of Forest Economist at the Lake States Forest Experiment Station, University Farm, St. Paul, Minnesota.

Daugherty, Charles I., Ex-'22, Clayton, Idaho. Daugherty is Senior Ranger on the Challis National Forest.

Davis, Robert, '28, Forest Service, Ogden, Utah, was married to Miss Helen Boyd at Ogden, April 10, 1931. The Idaho Forester extends congratulations.

Decker, Arlie D., '13; M.F. Yale '17, is a frequent visitor from Potlatch, Idaho, his home. He is manager of the Cedar Pole Department of the Potlatch Lumber Company.

Doyle, Ivan S., '26, is in charge of the Clearwater Timber Company's central warehouse at Headquarters, Idaho.

Drissen, John Phillip, '21, is Forest Supervisor of the Yakima Indian Reservation, Toppenish, Washington.

Ellis, F. Gordon, '28, Lakeview, Oregon. Ellis reports a lot of news, not the least of it being his marriage last December. He has been promoted to Junior Range Examiner on the Fremont National Forest, Oregon. He complains of the weather and his own cooking in the field, but otherwise appears to be contented with his lot, which he says includes the handling of 80,000 sheep and 16,000 cattle.

Farmer, Lowell J., '30, c/o Department of Entomology, University of Idaho, Moscow. Farmer will receive the degree of Master of Science in Forestry in June, 1931, his major being in forest entomology—"going bugs" as it were. He has accepted an appointment in the Department of Entomology, U. S. Department of Agriculture.

Farrell, J. W., '22, has just been promoted from Deputy Supervisor on the Idaho National Forest to Supervisor of the Challis National Forest, and will live at Challis, Idaho. His new appointment became effective April 16, 1931.

Favre, Clarence E., '14; M.S. '15, Kemmerer, Wyoming. Favre, who is Forest Supervisor of the Wyoming National Forest, does not report any business depression on his forest. Unemployment, and even leisure, are prevented by timber sales, timber surveys, insect troubles, and the care of sheep.

Fenn, Lloyd A., '17; L.L.B. University of Montana '26, is Superintendent of Schools, owner of the Kooskia Mountaineer, and attorney at law, Kooskia, Idaho. He has organized a class in forestry in the Kooskia High School and is assisted in giving the instruction by the officers of the Selway National Forest. Surveying, telephony, slash disposal, mapping, lookout, and fireman work, welding and tool sharpening are among the subjects included. Forest officers are enthusiastic about the course and it is worthy of consideration by other communities.

Ferguson, Ray S., Special 1920-23, Kooskia, Idaho. Ferguson is District Ranger on the Middle Fork District of the Selway National Forest. He reports on the good work that Lloyd A. Fenn is doing in educating the high school boys of Kooskia in practical forestry.

Field, W. D., '26, Clearwater Timber Company, Lewiston, Idaho. "Walt" is Assistant Land Agent for the Clearwater Timber Company. His duties include supervision of the timber marking work for the company.

George M. Fisher was a recent caller at the School. He has been engaged in research with the Northern Rocky Mountain Forest Experiment Station since last June, but has now been transferred to the Intermountain Forest Experiment Station. He will return to the School in September.

Folsom, Frank B., Ex'22, is Senior Forest Ranger on the Deschutes National Forest, Bend, Oregon.

Fox, Charles E., '28, Deary, Idaho. Fox is Superintendent of Schools at Deary. He was working toward his Master's degree and teaching in the Botany Department the first semester of the school year. Mr. and Mrs. Fox are the parents of a boy, Bruce Gordon, born April 7, 1931.

Garin, George Illichevsky, '29; M.S. (For.) '30. George has been working for the Clearwater Timber Company at Headquarters, Idaho.

Garner, L. H., Ranger, '23, Hailey, Idaho. Garner is now District Ranger on the Sawtooth National Forest. He was married in 1925 and is now the father of three future foresters.

Genaux, Charles M., M.S. (For.) '29, Extension Service, Utah State Agricultural College, Logan, Utah. Genaux bears the titles of Extension Forester and Associate Professor of Forestry.

Gerrard, Paul H., '23, is Assistant Supervisor of the Clearwater National Forest and is organizing a force of four hundred men for the blister rust campaign this field season.

Godden, Floyd W., '27, McCall, Idaho. Floyd is another of the recent Idaho graduates who are making rapid advancement. It gives us great pleasure to report his promotion from District Ranger on the Salmon, to Assistant Supervisor on the Idaho National Forest. The change took effect April 16, 1931.

Guernsey, William G., '29, 618 Realty Building, Spokane, Washington. "Bill" is Junior Forester in the Bureau of Plant Industry, Office of Blister Rust Control, Spokane. He says forestry still appeals to him as a life work.

Gustafson, Carl, '26, M.S.F. University of California '29. "Gus" still holds the record in Region Four for hiking and eating. The last address we have is 219 Federal Building, Salt Lake City, Utah.

Hammond, George M., Ex-'20, 1622 North San Fernando Road, Glendale, California. Hammond is First Vice-president and Secretary of the Bo[illegible]man Lumber Company, a retail lumber and [illegible] concern. He says that he finds hi[illegible]nowledge of wood and forestry [illegible] to him in the buying end of the [illegible]ness.

Hand, Ralph L., Ranger '22, St. Maries, Idaho. Ralph was transferred last April from the Selway National Forest to the Round Top District on the St. Joe.

Harris, Thomas H., M.S. (For.) '30, 618 Realty Building, Spokane, Washington. Harris is Junior Forester in the Office of Blister Rust Control. His summer work is in the Sierra Nevada of California on experimental eradication of Ribes.

Hatch, Alden B., '28; M.F. Yale '29, returned in January from Sweden, where he spent nearly two years doing research work under a Fellowship from the American-Scandinavian Foundation. While in Europe he visited a number of experimental forests in Finland and Germany. He is now in the office of silviculture of the Allegheny Forest Experiment Station with headquarters at 3437 Woodland Avenue, Philadelphia, Pennsylvania.

Hoffman, Henry C., '27; M.S. (For.) '28, is Junior Forester, Region 4, Ogden, Utah.

Huntington, Collis, '26, Bend, Oregon. Huntington is now in charge of recreation on the Deschutes National Forest.

Jackson, Thomas B., '19, Hilt, California. Jackson has recently been made Resident Manager of the Hilt Lumber Company, an auxiliary of the California Fruit Growers Supply Company. The Idaho Forester extends congratulations.

Johnson, Royal, '27, c/o Clearwater Timber Company, Lewiston, Idaho. "Jerry" is with the Clearwater Company as assistant time-keeper and head of the fuel department.

Keene, Edward L., '29, is a Junior Forester in Region 4, Forest Service Building, Ogden, Utah.

Kennedy, Fred H., '29, Forest Service, Ogden, Utah. Fred is Junior Range Examiner, working out of the Ogden Office of the Forest Service. He states that he plans to take advanced work for the Master's degree this coming year.

Klepinger, Franklin, '30, Park Service, Belton, Montana.

Krueger, Otto C. F., '29, Box 164, Auburn, California. Otto resigned from his position as Extension Forester for the State of Idaho, ef-

fective March 1, 1931. He expects to return to his work in the Forest Service after a visit to his home at Auburn. Otto just announced the arrival of a son, Otto Jr., born April 30, 1931.

Krummes, William T., '30, 1316 East Bannock Street, Boise, Idaho. "Bill" is Junior Forester in the Biological Survey, U. His work consists of the examinat for purchase as migratory bird refug

Lansdon, William H., '27, Box 725, Butte, Montana. "Bill" is with the geological department of the Anaconda Copper Mining Company.

Langer, Charles J., '30, Fort Duchesne, Utah, is now in the Indian Service with the title of Forest Guard, which is equivalent to Forest Ranger in the Forest Service. We congratulate Mr. and Mrs. Langer on being the parents of a girl. He says he gets along fine with the Indians but has not learned to speak their language yet.

Lehrbas, Mark M., '27, Forest Service, Alexandria, Louisiana. "Polly" is a Junior Forester detailed to land appraisal work for the War Department. He has just completed an appraisal of three million acres for acquisition at appraisal value of twenty-five million dollars. His new assignment is on acquisition of southern pine land in Florida and Louisiana. He has recently taken and passed the civil service examination for Asssitant Forest Economist, so we expect further promotion for him.

Lindstrom, C. E., Box 65, Cambridge, Massachusetts, is District Representative for the Weyerhaeuser Sales Company, distributors of Weyerhaeuser Forest Products from Weyerhaeuser Inland Empire and West Coast Mills. His District comprises Boston and Cambridge, Massachusetts and their metropolitan areas, where there is a ready market for Idaho white pine, Inland fir and larch, white fir, West Coast hemlock, and western red cedar.

McLaughlin, Robert P., '25; M.F. Yale '26, Yale Forest School, New Haven, Connecticut. "Bob" is working on his Ph.D. at Yale, expecting to return to the teaching profession as soon as he has made an endurance record as a student. He reports that he saw several of the Idaho graduates at the meeting of the Society of American Foresters in Washington last winter.

Malhotra, Des Raj, '25, is Assistant Conservator of Forests to the State of Kashmire at Jammu, Kashmire State, India.

Malmsten, Harry E., '17, is Assistant Professor of Forestry at the University of California, Berkeley.

Martin, P. J., '18, 705 North 50th Street, Seattle, Washington. Martin is Northwest Supervisor for Chapman and Company, an insurance corporation of San Francisco. His work consists largely in travelling his territory, including British Columbia and Alaska. He says he often sees some of the old Idaho foresters. His avocation is the collection of rattlesnakes, and he is known as the "Rattlesnake King of the Northwest". The Spokesman Review, Spokane, Washington newspaper, of April 30, 1931 carried a story of his work under the caption "Martin, Snake King, is Here." Another article by him on this subject appeared in the May 10, 1931 issue of the same paper.

Miller, William B., '22; M.S. (For.) University of California '25, is Assistant Range Examiner, Biological Survey, Reindeer Investigations, Nome, Alaska. On account of great distances and scarcity of roads, his chief mode of travel is by airplane. Word has just been received that Byron has been obliged to take a temporary leave from his office on account of throat trouble and is now in the Veterans' Hospital at Walla Walla, Washington.

Mitchell, William W., '28, Dunwoody Home, Newtown Square, Pennsylvania. "Shy" has not yet entirely recovered from his long illness. He would like to hear from any of the Idaho graduates. We all hope he will soon be able to take a junior forester position, which he qualified for by passing the Junior Forester Examination before graduating.

Munson, O. C., c/o Pacific Telephone and Telegraph Company, Santa Rosa, California. Oscar is District Plant Engineer of this company. His work consists of supervision of the engineers who plan in detail the outside improvements. He says he never realized before how much all industries consisted in costs. Some reminiscences of his days with the Potlatch Timber Protective Association are written up in this issue.

Nettleton, H. I., M.S. (For.) '28, is Silviculturist to the Klamath Indian Reservation, with headquarters at Klamath Agency, Oregon. He is in charge of all timber sales on the Reservation.

Olsen, C. C., '26, Cascade National Forest, Eugene, Oregon. Olsen is superintendent of construction on the Cascade Forest. He reports seeing several of the Idaho graduates.

Otter, Floyd, '29, resigned as Junior Forester from the U. S. Forest Service last September to accept an Instructorship in Forestry at the University of Idaho. Mr. and Mrs. Otter are the parents of a boy, Jason Jerome, born July 20, 1930.

Patrie, C. R., '21, Nespelem, Washington. Patrie has been promoted from his position on the Klamath Indian Reservation to the office of Forest Supervisor on the Colville Indian Reservation. This reservation comprises 1,377,385 acres of which 1,000,000 are timbered.

Pike, G. W., '27; M.F. Yale '28, Deadwood, South Dakota. Pike is a Forest Ranger in the Black Hills. He drove to Connecticut last winter and saw several of the Idaho graduates. At the time he wrote he was Acting Assistant Supervisor. The business depression does not seem to have affected his work any. He says he has been getting out 10,000 logs a month on his district.

Potter, Arthur, Ex-'26, U. S. Forest Service, Boise, Idaho. Potter is Assistant Forest Supervisor on the Boise National Forest.

Pugh, L. R., '26, Springston, Idaho. Pugh is sales manager for the Russell and Pugh Lumber Company and in that capacity does considerable travelling covering all parts of the United States. He has visited the University several times the past year.

Renshaw, E. W., '25, U. S. Forest Service, Avery, Idaho. Renshaw is Senior Forest Ranger on the St. Joe National Forest.

Rettig, E. C., '19, Lewiston, Idaho. Mr. Rettig is Land Agent for the Clearwater Timber Company. He spent a day in Moscow recently to address the class in forest management on the selective cutting system of the Clearwater Timber Company. This Company is operating on a sustained yield basis.

Rodner, Jack W., who makes Moscow his headquarters, is in the field most of the time. At present he is cruising timber for the Blackwell Lumber Co. at Emida, Idaho.

Rowe, Percy B., '28; M.F. Yale '30. Percy was graduated *cum laude* from the Yale Forest School in June, 1930. He was married June 4, 1930 to Mary Evelyn Pendry, and they have their home at Ogden, Utah, where Percy is Junior Forester in the United States Forest Service.

Sajor, Valentin, '26; M.F. Yale '27, Bureau of Forestry, Manila, P. I. Sajor has been promoted to Assistant Chief of the Division of Licenses in the Philippine Forest Service, his appointment becoming effective July, 1930.

Saling, Wallace M., '28; M.S. (For.) '29, U. S. Forest Service, Boise, Idaho. "Smoky" is a Junior Range Examiner in charge of grazing survey, and field erosion studies on the Boise Forest. He was a Moscow visitor during the winter.

Sargeant, Howard, '30, Bureau of Biological Survey, Washington, D. C. "Shorty" is a Junior Forester and is examining lands suitable for purchase as bird refuges. He was a visitor at the School of Forestry in April.

Schofield, William R., '16, 319 Brett Street, Eureka, California. Schofield is Secretary-Manager of the Humboldt Redwood Reforestation Association, and Secretary-Engineer of the Humboldt County Planning Commission. The latter commission is a newly created body of county government in California which deals with the development of a master plan for highways, parks, public buildings, for the physical development and general welfare of the county.

Sharma, P. D., M.S. (For.) '22. Sharma is Technical Adviser to the Forestry Department in the State of Gwalior, India.

Sharp, Andrew G., M.S. (For.) '29, Spruce Falls Power and Paper Company, Kapukasing, Ontario, Canada. He was married November 6, 1930 to Miss Ethel Lafferty of Spokane, Washington.

Snow, E. A., '25, Hot Sulphur Springs, Colorado. Snow is technical assistant on the Arapahoe National Forest. His work consists of general administrative duties.

Sowder, A. M., '25; M.S. (For.) '27, after three and one-half years of service as Extension Forester to Idaho was transferred to the School of Forestry as Assistant Professor of Forestry, his new appointment becoming effective September 1, 1930.

Space, Jackson, '27, U. S. Forest Service, Flagstaff, Arizona. "Jack" has been promoted from Forest Ranger to Junior Forester. He likes the Forest Service fine and expects to be in Arizona for some time to come. He states that he saw Lester Bye recently.

Space, Ralph S., '25, Trigo, Montana. Ralph is Forest Ranger on the Blackfeet National Forest.

Spence, Liter E., '28; M.S. (For.) University of California '30, resigned his position of Junior Range Examiner in Region 4 of the U. S. Forest Service September 1, 1930 to accept a call as Instructor in Forestry, School of Forestry, University of Idaho. He was married December 27, 1930 to Miss Ethel Woody.

Stanley, Wilfred B., '30, c/o Clearwater Timber Company, Lewiston, Idaho. "Bill" is with the Clearwater Timber Company in the capacity of Check Scaler at the mill.

Staples, Howard W., '20, Moscow, Idaho. Staples is assistant cashier in the First National Bank

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SUMMER SOJOURNS OF STUDENTS

Adams, Tom, will be located at Metaline Falls, Washington, where he will be employed by the U. S. Forest Service as lookout fireman.

Anderson, Torney E., is looking forward to a summer on his old stamping grounds—the Coeur d'Alene National Forest. His job will be that of alternate ranger with the U. S. Forest Service.

Andrews, Milton, won't be any farther away from Moscow than Sandpoint where he has employment with the U. S. Forest Service as warehouse foreman.

Arthurs, A. J., reports he can be reached through the U. S. Forest Service, Coeur d'Alene National Forest, Coeur d'Alene and expects to be an alternate ranger.

Aust, Paul, will be stationed at Fort George Wright, Spokane, for six weeks this summer at R.O.T.C. training camp.

Baldridge, Fred, has not completed his plans for the summer but can be reached by mail at Payette, Idaho.

Benson, Rudolph, gives his summer address as c/o Beaver Creek Ranger Station, Coolin, Idaho and his occupation as smoke chaser.

Brown, Harold G., plans to return to his home in Port Townsend, Washington for the summer vacation.

Burnett, Loyd, has a field job with the Office of Blister Rust Control to command his summer's attention.

Cline, William, has no definite plans for the summer at time of going to press but a letter addressed to him at Hansen, Idaho, should reach him.

Cook, John B., is going to be a smoke chaser this summer on the Idaho National Forest at Cold Meadows.

Coonrod, Melvin A., expects to keep busy on fire protection work for the Boise Payette Lumber Co., Boise, Idaho.

Daniels, Kenneth, hopes to line up work on a blister rust crew this summer. His home address is 518 Third St., Moscow.

Dell, Robert A., will be at his home town of Spirit Lake this summer doing fire patrol for the State.

Dittman, Clarence, is undecided as yet as to his summer vocation. He gives his mailing address as 766 Liberty St., Aurora, Illinois.

Dresskell, Wilfred, is not sure at time of going to press what he will be engaged in this summer but his home address is Rosalia, Wash., Box 44.

Eastman, Virgil, has not completed his summer plans but can be reached at 512-15th Avenue N., Nampa, Idaho.

Edwards, Harold O., as a lookout for the U.S.F. S., Kelley Creek Ranger Station, out of Pierce, Idaho, will see a lot of the world this summer.

Ensign, W. Warren, will be engaged in forest protection work for the summer on the Blackfeet National Forest, Kalispell, Montana.

Erickson, Maurice, states "I will be one of a 3 or 4 man crew working on trails 50 or 60 miles from civilization on the Selway National Forest, out of Kooskia, Idaho."

Fagerlund, Gunner, gives his summer address as that of Rolla, North Dakota.

Farber, Joseph, has trail construction work lined up for the summer. He will be on the Pend O'Reille Forest, Sandpoint, Idaho.

Farmer, Lowell J., will not camp long in any one place this summer though his permanent address is given as Bureau of Entomology, Division of Forest Insects, Coeur d'Alene, Idaho. He will be in Wyoming however most of the summer, in the vicinities of Yellowstone National Park, Sullivan Lake, Beaverhead Forest and the Big Hole Country.

Featherstone, William, has work lined up on the St. Joe National Forest, Pole Mt. District, St. Maries, Idaho, on a trail crew.

Fickes, Maurice, will be engaged in trail work on the Nez Perce District for the Forest Service out of Grangeville, Idaho.

Fifield, Charles E., expects to run trail traverse this summer on the Clearwater National Forest, c/o Bungalow Ranger Station.

Frayer, Hume, will do some forest mapping on the Kaniksu National Forest, near Falls Ranger Station, Priest River, Idaho.

Fritchman, Holt, will again be in charge of a blister rust camp for the summer.

Gaffney, Wm. S., for summer occupation says "lookout—Clearwater National Forest", and gives his address as c/o Musselshell Ranger Station, Weippe, Idaho.

Gill, Tyler S., will be employed by the U. S. Forest Service out of Kemmerer, Wyoming, on beetle control work and tie cruises.

Gregory, Eldon, has been engaged for the summer by the Forest Service at the Benton Ranger Station, Priest River, Idaho.

Hayes, G. Lloyd, will help improve forest trails this summer on the St. Joe National Forest, in the Avery District.

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Hepher, W. Stanley, whose home is Boswell, B. C., Canada, reports he has been given employment by the B.C. Forest Service as Assistant Ranger.

Hill, Edward B., is expecting to do timber cruising and bug eradication work for the U. S. Forest Service, out of Afton, Wyoming.

Hopkins, Jesse, has not completed his summer plans but gives his address as 239 S. Almon St., Moscow.

Hume, John F. Jr., will return to the Shiloh Ranger Station, Naples, Idaho where he will have the title of alternate ranger on the Pend O'Reille National Forest.

Jemison, George M., liked his work at the Forest Experiment Station near Priest River, Idaho, so well last year that he will return there this summer as fire study assistant.

Jensen, Clifton E., will be on blister rust control work for the summer but just where he will be stationed he does not definitely know.

Jeppesen, Marvin, has employment with the U. S. Forest Service, Mackay, Idaho, for the coming vacation.

Kellogg, Robert, will either go on blister rust control work or as a member of a trail crew for the summer months.

LeBarron, Russell K., announces his summer address will be the Honeysuckle Ranger Station, Coeur d'Alene, Idaho, and his employment along the line of fire protection.

Lord, Philip, intends to vacation on a grazing survey in Region 2. A letter addressed to him at 1317 Gates Pl., S. Pasadena, Calif. should reach him.

McConnell, Wilbur, is looking forward to a summer in the woods on blister rust control work.

McCormick, Henry F., has summer employment with the U. S. Forest Service, Magee Ranger Station, Coeur d'Alene, on trail crew.

McKinnon, Ben D., is not sure of his summer address but his employment will be in the nature of Ribes eradication for the Office of Blister Rust Control.

March, Maurice W., is going to march as a fire guard for the U. S. Forest Service, near Hailey, Idaho.

Martin, Paul, will "vacation" near Glacier Park, Belton, Montana, with fire protection work as a hobby.

Miller, R. B., states he can be reached at Salmon, Idaho, Box 373.

Milner, James A., expects to be located on the Clearwater National Forest with the blister rust control field force.

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BONFIRE MEETING STARTS YEAR

The first meeting of the Associated Foresters for the current school year was the "Bonfire Meeting". This meeting was held on the campus near the Arboretum and was very informal. The meeting was presided over by George Jemison, president of the club, who welcomed the new students to the organization. After the copious refreshments, the forestry quartet and several other talented musicians in the group performed to the delight of the foresters. Faculty members and the officers of the Associated Foresters were introduced and responded with short talks.

DIRECTORY AND ACTIVITIES OF ALUMNI AND FORMER STUDENTS

(Continued from page 60)

at Moscow. He is interested in the Moscow Air-Port as a sideline.

Stowasser, Clarence, '30, 525 West Summit Avenue, Coeur d'Alene, Idaho.

Walrath, F. J., '27, Orofino, Idaho.

Toole, Arlie W., '27, is Junior Forester in the Office of Indian Affairs at Klamath Agency, Oregon.

Wheaton, Rogers G., '24; M.F. Yale '25, 733 Public Service Building, Boston, Mass. Wheaton is in the Sales Department of the Page and Hill Company, dealers in western red cedar poles. He reports the arrival of a son in their home recently.

White, Harold Z., '26, 624 Sixth Avenue, Lewiston, Idaho. Harold is Superintendent of the Dry-kiln Department of the Clearwater Timber Company Mill at Lewiston, and recently escorted the lumbering class through the mill.

Wiesehuegel, E. G., M.S. (For.) '29, accepted last September a call to the University of Ohio, Columbus, as Assistant Professor of Forestry.

Williams, Guy V., '27, 704 McKinley Street, Boise, Idaho.

Woodward, Doren E., '30, Bureau of Biological Survey, Washington, D. C. Woodward is on land estimation work for proposed migratory bird refuges. His title is Junior Forester. He spent last summer in Nebraska, Wyoming, and Nevada, but during the winter has been working on final maps in the Washington Office. He discovered that he needed to be a draftsman, surveyor, and artist besides being a forester.

SUMMER SOJOURNS OF STUDENTS

(Continued from page 62)

Morgan, Dan, will busy himself the next few months chasing smoke on the Coeur d'Alene National Forest, near Coeur d'Alene, Idaho.

Morganroth, Earl S., does not plan to leave Moscow this summer and gives his address as that of 626 Ash Street.

Moss, Virgil D., will be in charge of a blister rust camp near the Musselshell Ranger Station, near Weippe, Idaho.

Newcomer, Fred R., indicates that Banner, Wyoming, will be his address.

Parker, John W., is going to chase smoke for the Forest Service near Cascade, Idaho.

Parks, H. W., has the position of assistant ranger at McCall, Idaho ready for him when school is out this spring.

Pechanec, Joe, will remain in Moscow to attend summer school and carry on some research work.

Raide, Theo. E., expects to find fire protection work for the Forest Service to his liking. He will be stationed near Prichard, Idaho.

Redman, E. E., is returning to the Cache National Forest, to do grazing administration work for the U. S. Forest Service.

Richards, Horace, will grade lumber this summer at Bend, Oregon. "Hod's" address is 232 Congress St.

Roesch, Winston, anticipates a summer near Orofino, Idaho, on field work for the blister rust control.

Schaller, Maurice, is not certain where he will be this summer but gives his address as 105 N. Asbury, Moscow.

Schumaker, Frank, will be employed by the U. S. Forest Service, near Metaline Falls, Washington, as a lookout and smokechaser.

Shank, Paul J., states his summer occupation will be along the line of timber survey work on the Fishlake National Forest, Beaver, Utah.

Simons, Guy Kent, has signed to go with the blister rust control field forces at Headquarters, Idaho.

Stilwell, C., gave his summer address as that of Nordman, Idaho, c/o Bismark Ranger Station.

Swanson, Raymond, will be employed on the Coeur d'Alene National Forest, Coeur d'Alene, Idaho.

Swayne, Allen P., will return to blister rust control work. His home address is Box 56, Melba, Idaho.

Talbot, George O., expects a job in the capacity of smoke chaser with headquarters at the Allen Ranger Station, Darby, Montana.

Taylor, C. N., has road survey work lined up for the summer. His address is R. R. 1, Nelson, B. C.

Thornber, Merrill S., will be located near Orofino, Idaho, engaged in blister rust work.

Tobin, Ed., is looking forward to blister rust control work near Pierce, Idaho.

von Bargen, John, is going to look the country over from a lookout near Kooskia, Idaho, c/o U. S. Forest Service.

Ward, John, will build telephone lines this summer in the vicinity of the Musselshell Ranger Station, Weippe, Idaho.

Wellner, Charles, states he can be reached this summer at 344 Third Ave. E., Twin Falls, Idaho.