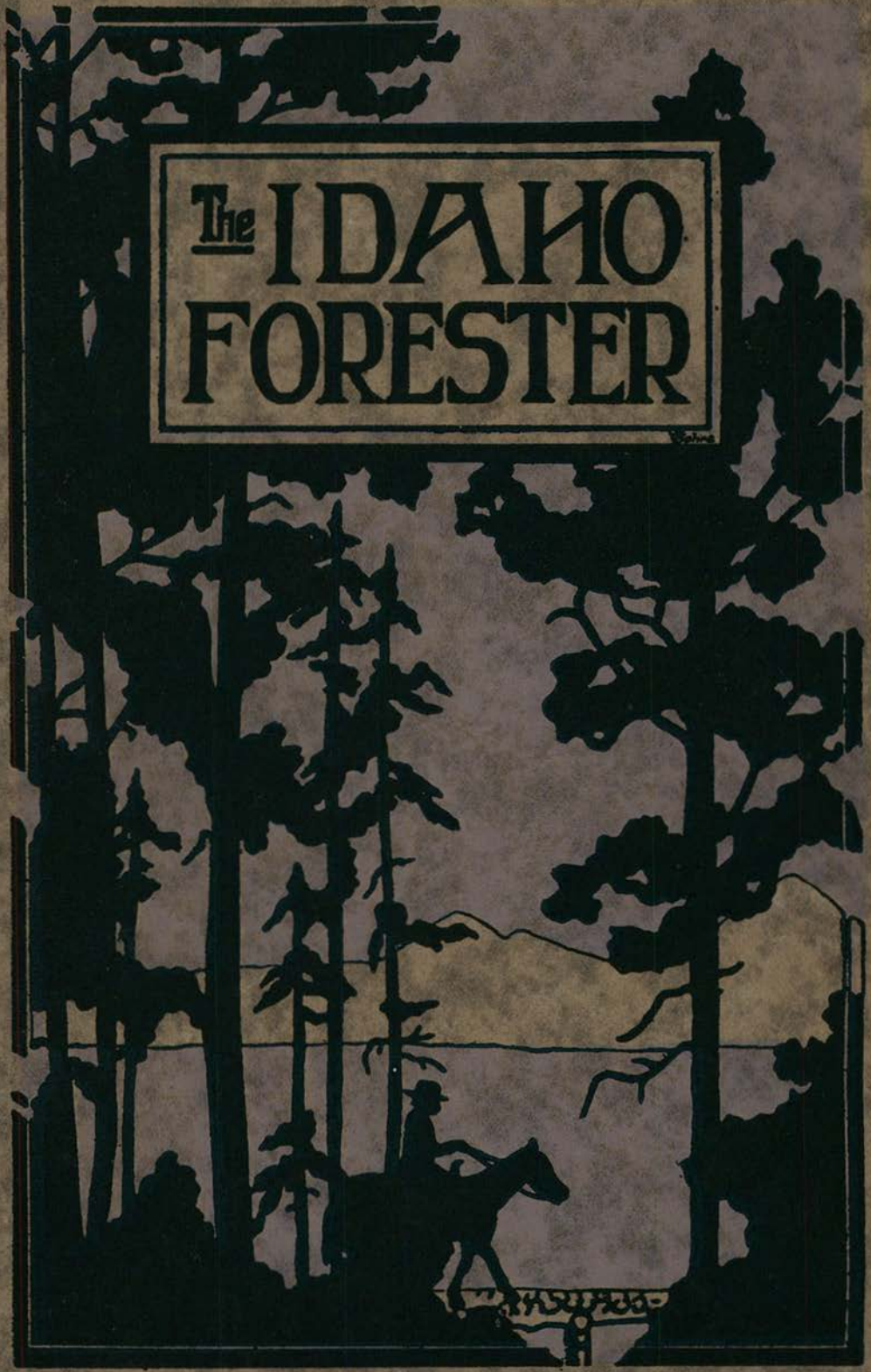
The IDAHO FORESTER



The Idaho Forester

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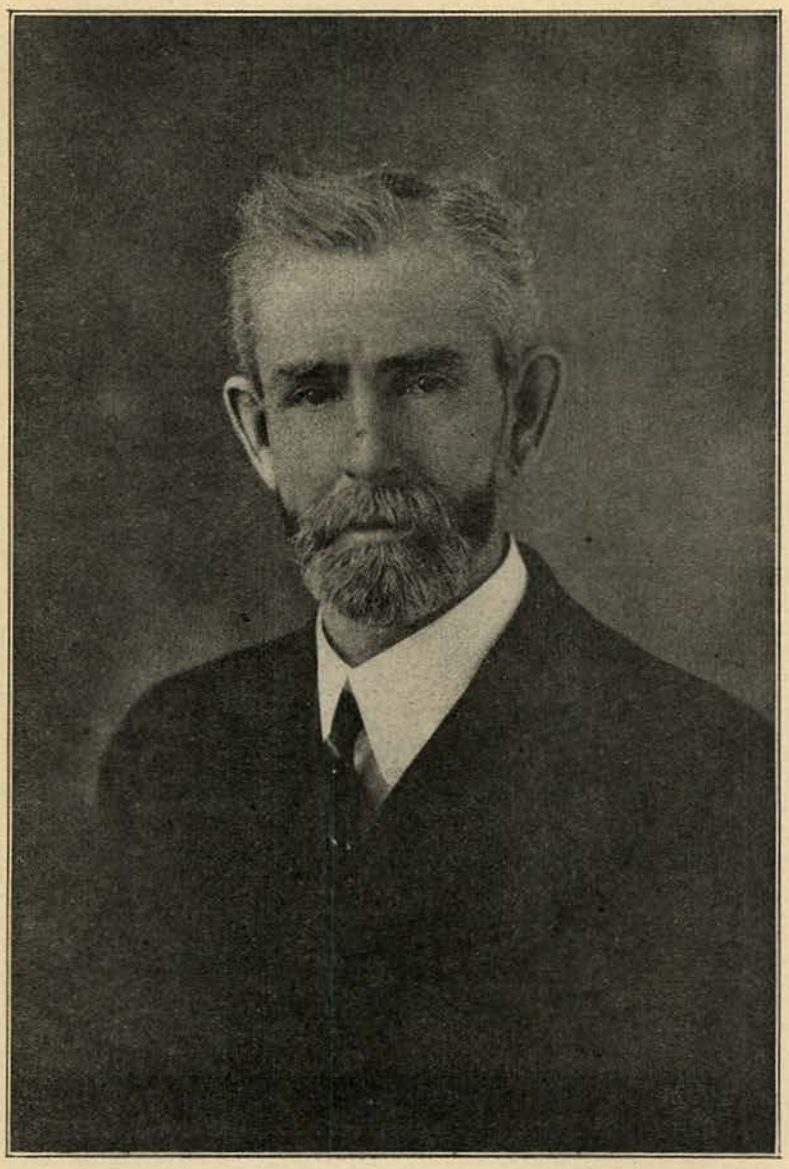


Dedicated to

CHARLES HOUSTON SHATTUCK, Ph.D.

First Dean of the Idaho School of Forestry

whose keen foresight, sound judgment and untiring devotion carried the Idaho School of Forestry through the uncertain period of establishment and laid a foundation which makes its future secure.

IN RETROSPECTION

By DR. C. H. SHATTUCK

What can be written which may be of interest to those who con the pages of "The Forester" for 1922 by one who turns back through history some thirteen years to the early struggles and small beginnings of the Idaho School of Forestry? The present writer arrived in Moscow September 1st, 1909, having moved three thousand miles in order to take charge of this recently established department for the state of Idaho.

Memory Pictures

Memory records the picture of the dust covered little town, as Moscow then was at the close of a long dry season, without one foot of pavement, either with no sidewalks, or more or less dilapidated ones made of boards mostly well worn and badly warped by the summer sun, the only bits of concrete walks being in front of the Hotel Moscow, the First National Bank, and Davids Department Store. So much for Main Street.

The front of the Administration Building and Morrill Hall constituted the chief college buildings, at that time the President's office being in the "Gym." The Campus was brown, uncut, and, save for the line of trees on either side of the main drive, was practically void of trees and shrubbery.

The Forestry Department, as I soon learned, then consisted of one 7x9 office on the first landing of the stairway in Morrill Hall, one office desk, one office chair, one other chair, and one professor in charge. In fact if there had been even one student the "oneness" would have been complete. The surroundings were lonesome and the solitude oppressive, and, as on that first day I sat alone in my little office, an utter stranger in the big, new State, I thought of Cowper's lines, "But grant me still in my retreat one friend to whom I may whisper 'Solitude is Sweet.'" However, I had little time for such musings. I soon found that one friend, and many more, who have proved to be the friends of a lifetime, and whose interest in forestry, warm sympathy and hearty cooperation for and in all lines of forestry work were an ample stimulus, and at once not only dispelled all feelings of lonliness, but inspired me to the utmost exertion in the various lines of the many sided subjects of Forestry in Idaho.

Early Friends

The first faculty member to call on me with offers of co-operation and kindly suggestions was Dr. J. M. Aldrich, now of the National Museum, Washington, D. C., who was then in charge of Zoology and Botany. The first Idaho lumberman was W. D. Humiston who had recently taken charge of the Land Sales Department of the Potlatch Lumber Company. I found him to be well informed on Idaho forestry conditions, and intensely interested in the future of the forestry department. He made many helpful suggestions and assured me of the hearty co-operation of his company in all that pertained to the good of the forestry department, and offered me the use of the company's cruising records and cuts of Idaho Timber in the preparation of the first forestry bulletin which it was decided should appear at once, as no announcement of any kind had been published relative to courses, etc. To Major Frank A. Fenn, then Supervisor of the Bitterroot National Forest, probably more than to any one man, is due the greatest amount of credit for effort put forth to establish a department of forestry at the U. of I. In the early years of the department when funds were not to be had to defray the expenses of special lecturers, Major Fenn on several occasions favored the department, entirely at his own expense, with a series of most excellent and practical lectures on various phases of forestry. He also made it possible, by furnishing horses and equipment, for members of the department to visit his forest, collect plants and wood speciments, make growth and fire studies, etc. Mention should be made of the efforts put forth by William Deary and A. W. Laird, the active managers of the Potlatch Lumber Company. These men not only allowed the faculty and students the freedom of their large mills and camps, but donated timbers and lumber for seasoning and kiln-drying experiments, stumps and other material for distillation experiments, and actually furnished maintenance, horses, etc., to members of the department in making fire and growth studies, land clearing experiments, etc. It is a pleasure here to record that their every early pledge of support has been kept and that to this day the Potlatch Lumber Company and those in charge are the staunchest supporters

of the School of Forestry. The material and moral assistance given by this great organization should never be forgotten by the professors and students who may be connected with the School in the future. W. G. Weigle, Supervisor of the Coeur d'Alene National Forest also favored the struggling young department in many ways in addition to giving time and lectures at his own expense. Many other foresters and lumbermen showed a kindly spirit, encouraging students and faculty by their offers of co-operation and assistance.

First Efforts

I was soon very busy in the preparation of the bulletin above referred to, and when it was finished "The Star Mirror" ran the entire announcement in a special edition of the paper. This was very generally and generously copied by many papers in the state, thus giving the department a wide and unexpected publicity. This resulted in attracting a few students even though there were but two weeks until the University was to open. Two four year courses were offered, one conforming in a general way to the requirements of the Agricultural courses with forestry as the major subject and the other embodying more of biology and mathematics, and handling the forestry subjects in a more technical manner. These courses were approved by the faculty at their first meeting just before school opened. Then it remained to be seen if any students were to elect these courses, General Forestry being the only course required and that only of certain of the Agricultural students then numbering in all about thirty.

First Enrollment

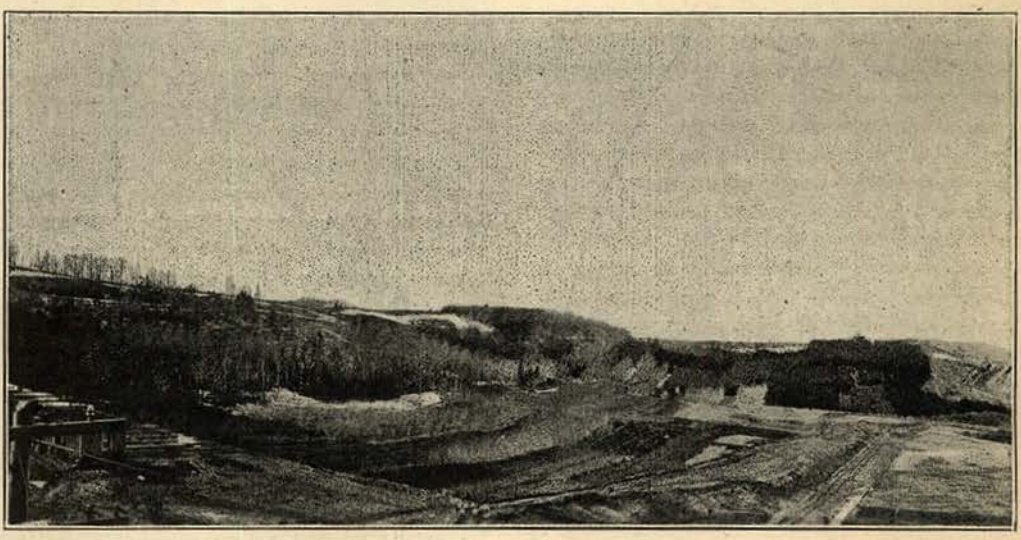
By the close of the first day of enrollment (quite an anxious day for me) six students, Wadsworth, Fenn, Denning, Kendall, Herman and Decker, had enrolled for the technical, or as it was then called, the long course in Forestry, and some ten or twelve "Ag." students had enrolled in General Forestry. The next day Hillman, McCurry, Thornton, Lundstrum and Hockett came in for the long course which completed the enrollment for the first year. Thus with but eleven regular students the department was organized for its first years work, its office having been moved to the third floor of Morrill Hall adjoining the lecture room and laboratory which had been set aside for class work.

From the very start there was much constructive work to be done, especially since it devolved on one lone "Prof" to do everything. Aside from the regular laboratory and lecture work, which was enormously heavy, field work must be mapped out, field trips made, articles written, public lectures given, mills inspected, microscopic and lantern slides made, herbaria prepared, equipment and apparatus ordered, besides the routine of faculty and university committee work, and as though this were not enough an unusually heavy correspondence soon developed. I shall never forget that first year with its complex of new duties, which, in carrying to completion, often kept me "at it" till well toward midnight. Had I not brought with me a very full line of well organized illustrative material, consisting of herbarium specimens, microscopic and lantern slides, etc., it would not have been possible to have given the heavy courses offered. But at the close of the year I was able, like Mark Twain in describing life on Sunday, to write "pulled through," glad it's over, never again, etc., in my diary.

Origin of the Arboretum

Soon after the school opened the Board of Regents held its first meeting and I was invited by President McLean to meet the members in session. They asked me if I had outlined any project of state wide importance upon which my department could begin operations, whereupon I proceeded to outline the work of the department as falling under three main heads, viz—Educational Forestry, courses, lectures, etc.—Destructive Forestry dealing with such subjects as lumbering, logging, and land clearing, and Constructive Forestry, or the planting of new forests, wood lots, wind breaks, regeneration of cut over lands, etc. I also urged the need of general planting of woodlots, shade trees, etc., in many of the treeless, but irrigable parts of southern Idaho, also the necessity for experimental planting in order to determine what trees could be successfully grown in different parts of the state with the idea of furnishing at cost a limited number of tested trees for shade, shelter, and decorative purposes. I suggested the establishment of the arboretum which met the approval of the board and I was asked to select a desirable site for the same. Much to the surprise of some of the members I asked for the steep, thistle-covered hillside, about fifteen acres, then an unsightly disfiguration back of the campus which no one seemed to want, and which could not be kept free from noxious weeds of every kind. One member of the Board generously suggested that I could have an "acre or so" of good level ground. I had

given this matter of site much careful consideration and knew exactly what I wanted but had not dared to hope that I could get this entire tract. I was therefore much surprised, elated, and delighted when they generously wished me success with the plat, although I felt sure that they all thought I had made a very poor selection. It was because of the general roughness of this tract that it was possible for the Department of Foretry to obtain so large an acreage in such advantageous proximity to the campus, and as it has since turned out, the very best forestry and arboretum site any where near Moscow. The north slopes are protected from the drying summer winds and direct rays of the sun and always receive liberal deposits of drifting snow and are constantly fertilized with Palouse dust which has not only built up the topography of the entire Palouse region, but has made the fine grained and fertile soil on these north slopes very deep and most ideal for rapid tree growth. The late melting snows tend to retard the growth of vegetation in the early spring on the north slopes thus enabling the less hardy species of trees to remain dormant until most of the damaging spring frosts are over. In fact it would be impossible to combine more favorable conditions in one site than we find in that which the arboretum now occupies, and the wonderful growth of the great number of species, as well as the beautiful campus background thus formed, amply attest this fact.



The University Arboretum in 1922

Early Struggles

So much for favorable combinations contributed by nature and the accident of convenient location, but the Arboretum as we know it today was not to come into being without its birth throes and many set backs due to lack of funds, want of exact knowledge of seasonal and climatic conditions, trained assistance, etc.

The forestry budget was distressingly meager, for when the department was established the salary of the professor to be in charge was practically all that was alloted in the way of a budget. I soon found that to purchase young trees for this tract would cost several thousand dollars and that the express on these would be almost as much as the cost of the trees since the bulk of the species desired would have to be purchased from eastern nurseries more or less widely separated. After extensive correspondence it was very evident that only a small part of the tract could be set to transplants in 1910 for want of funds. Finally two relatively small orders were placed, one with D. Hill and Co., Dundee, Illinois, and the other and considerably larger order, because of the liberal discounts offered by Dr. C. A. Schenck, with the Biltmore Nurseries, Biltmore, N. C. I would have preferred having this order from a northern nursery, but could find none offering either the wide variety of trees or reasonable price obtained here.

But much to my surprise the trees did fully as well as those coming from Dundee.

It was evident that we must grow our own trees from seeds, and seed-beds as now located, were laid out early in March 1910 (the dryest spring and summer ever known in Moscow). I was assured that no water or shade would be needed for these beds and we started out with that idea planting the seeds fairly shallow as I had seen them successfully planted in the great seed plots at Biltmore. Then we waited for the bursting of the seed-coats and the springing forth of the millions of seedlings, but alas! what a disappointment awaited us, for the March wind was the hottest and dryest ever known in Latah County, and the blistering sun soon dissipated every vestige of surface moisture, as a result only a very very few seeds germinated and most of these soon parched and blew away. Mr. Price and I soon saw that we were confronted with a stern fact (not a mere theory) and that if our beds were not both watered and shaded we were doomed to record a most humiliating failure. Meanwhile our orders of trees had arrived, the ground which had been plowed early, must be prepared and these trees set at once. There was much to do and all at once, very little help, and practically no money. However, by commandeering the good-natured campus engineer and a quantity of old piping, wreckage from the former "Ad" Building, we succeeded after much hard labor, in bringing water to our desiccated seed beds; and by impressing the entire forestry department we finally erected lath frame shades and in about a month got all the seedlings set out, the ground becoming very dry before the latter task was finished. The parching sun killed many of these trees in a few days, and every day added to the number of "casualties" until I was fearful that the entire undertaking would be a failure. However, a few cool days with moist winds which gave most of our sick trees a life lease until they could strike new roots into the fine moist soil of the cool hillside.

Necessity--the Mother of a New Method.

Mr. Price replanted many of the seed beds, placing the seed thickly an inch or more in depth, a method of his own still very successfully used by him. Soon we had a number of beds thickly set with strong seedlings, but the ones first put out in strictest accord with approved Eastern and German planting methods germinated very poorly, mostly not at all, and were very slow in starting growth, never equalling those planted deeper. Thus, a valuable lesson was learned almost at the outset which has contributed immeasurably to the success of all the extensive plantings which have done so much toward making the arboretum a success as well as all the tree planting work of the state. The young trees were dying rapidly and the seed beds were mostly bare when on June 20th I left the campus for my summer's work in the Bitterroot Mountains and the never to be forgotten experiences in the ravishing fires of 1910. I confess I was greatly discouraged over the prospects of the arboretum and nursery. Everything looked bad, the ground was the dryest I have ever known it to be at Moscow, the trees were sick, and so was I at heart, for I had never had to contend with so many unfavorable conditions before. Everything seemed to be against us. However, on returning in September I was highly gratified to see that many of the trees were not only alive but had made vigorous growth, and the seed beds, while late, had an excellent stand of the most lusty seedlings I had ever seen, the combined results of method, soil and care.

From this time on the success of the arboretum and nursery was assured, and it remained only to continue to plant and transplant as fast as we were able until the entire bare amphitheater was thickly set in trees of every species possible to obtain or to grow. Soon the ground was covered with green, slowly becoming denser and higher, and gradually forming the beautiful back ground to the campus and athletic field as we know it today and as those who come after us will cherish even more than we have done, because its beauty and magnitude are even yet only in their infancy, many years being required for most of these trees to reach maturity. The nursery and distribution phase of this tree planting work is not so readily appreciated because the results are so widely scattered and therefore harder to see and measure.

Has Made Many Homes More Homelike

Yet many Idaho homes in both towns and country, as well as many parks and streets, are much more inviting because of the vast

number of thrifty seedlings sent out over the state each year. These are little appreciated at first, but like the arboretum, become more attractive each year. I meet these trees in all parts of the state and probably appreciate more than most people the splendid growth they are generally making as well as the beauty and value which they contribute to property either private or public.

Too much credit cannot be given to our Forest Nurseryman, Mr. C. L. Price, who has been in charge of all the tree setting and seed planting work since March, 1910. To his skill, devotion, and untiring efforts more than to the labor of any one else is the success of the work chiefly due. He has for the past twelve years put his entire life most unstintingly into this work and has pressed forward often unaided and alone in the face of many drawbacks and difficulties not here possible to mention, many of which would have discouraged a man of less sterling qualities of character and determination. No words of mine can properly portray his devotion to this work nor bespeak for him the appreciation and reward which is his just due. He is doing much for the future beauty and attractiveness of Idaho. "The groves were God's first temples" and the spreading boughs of a mighty oak or elm has determined the place of abode (the old homestead) of many succeeding generations in many lands who have found rest and comfort beneath these sheltering branches. A home without trees lacks much. He who plants a tree plants not for himself alone, for those who come after him may often enjoy the benefits of his labors even more than those of his own generation. Thus this work is doubly worth while, blessing not only the worker but those who live after him.

In recounting this simple story of the early tree planting struggles of the Department it is hoped that students of the School of Forestry and all students and friends of the University of Idaho may come to know something of what it has taken to establish and care for the wide range of species, many not growing elsewhere in the state, which now point their cathedral-like spires heavenward, not only in the arboretum but in many other parts of the state, adorning the landscape and improving property in town and country and in the arboretum, instructing all who will take time to learn about trees.

It is the sincere wish of the writer, who counts Idaho as his home, that this work begun under great difficulties, now only memories, may have the support of all good people in the state; and that as time goes on an increasing number may avail themselves of that aid which this project was inaugurated to give.

XI SIGMA PI

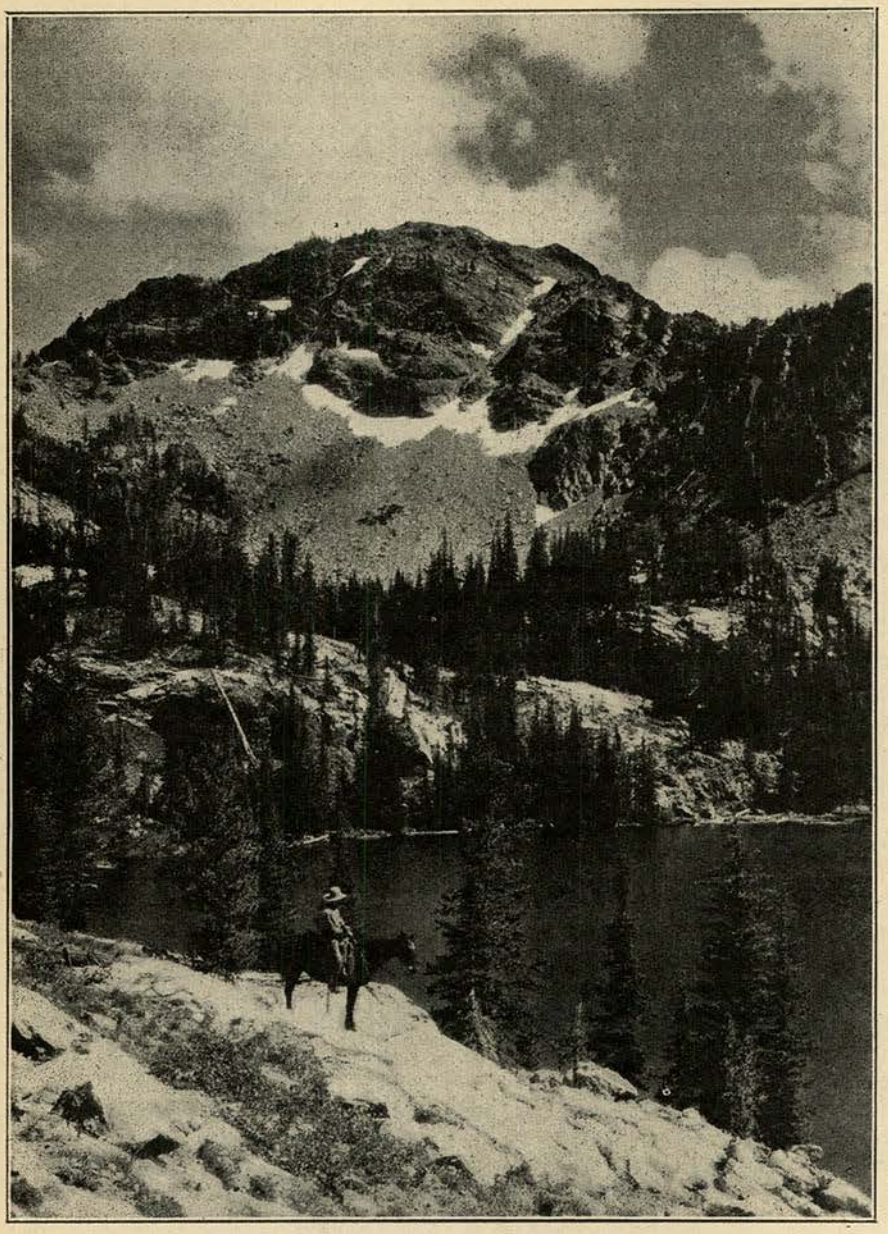
Xi Sigma Pi, the oldest honorary forestry fraternity, was founded in 1908, in the College of Forestry and Lumbering, at the University of Washington and since that time five new chapters have been added. Epsilon chapter was established at the University of Idaho in 1920, and now, Idaho forms a link in a chain of chapters from the Pacific to the Atlantic.

The objects of the fraternity are to secure and maintain a high standard of scholarship in forest education, to work for the upbuilding of the profession of forestry, and to promote fraternal relations among earnest workers engaged in forest activities. The idea of scholarship and leadership in forest activities has always been uppermost in the selection of members. As much weight is placed upon a man's practical ability, such as adaptability to forest work or lumbering, capacity for leadership, and promise of attainment, as is placed upon his scholastic work. By this means of grouping, and by stimulating the desire of the underclassmen for election to the fraternity it is hoped that these objects may be attained.

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

The newly chosen members for the present year are:

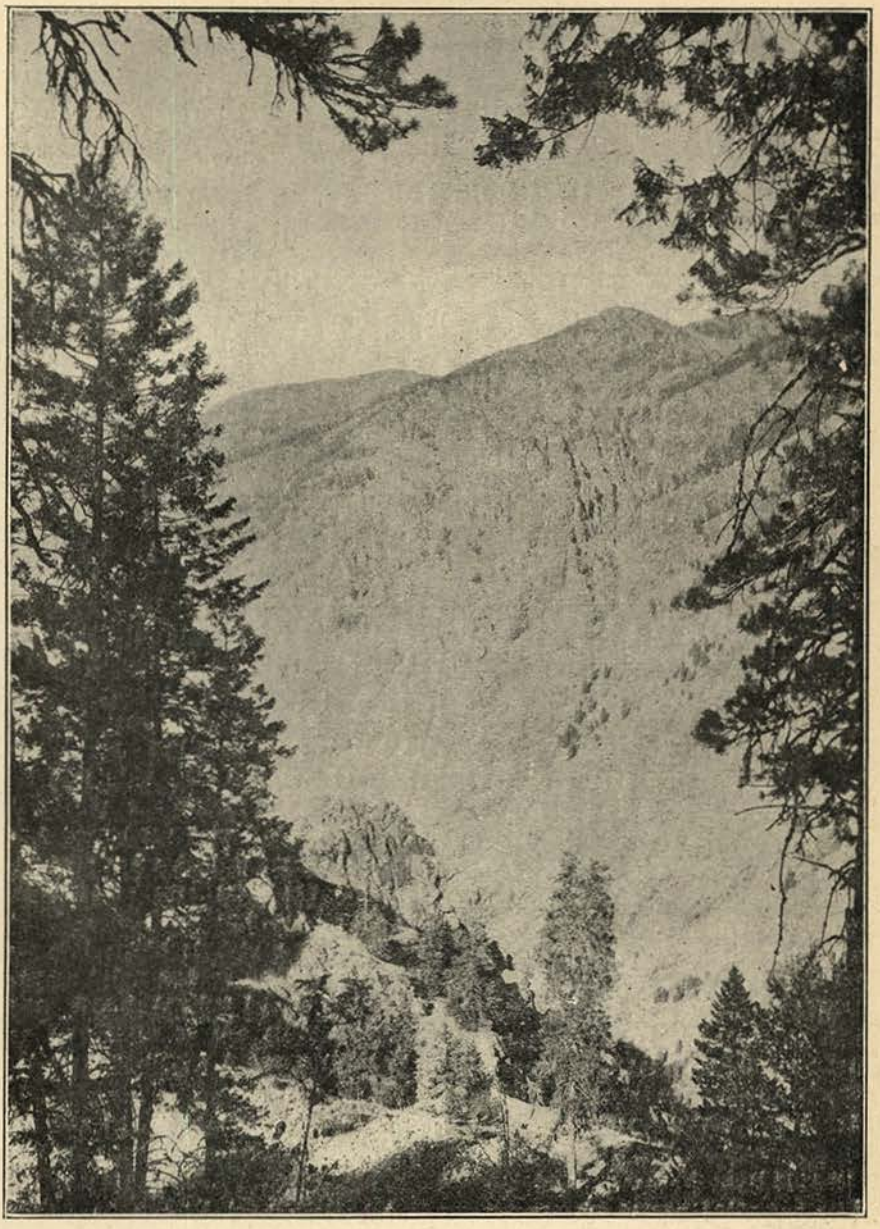
Russell M. Parsons, '23; Herman C. Baumann, '23; Prof. C. W. Watson; P. D. Sharma, graduate student.



THE SCENIC RESOURCES OF IDAHO

By ARTHUR M. PIPER
Assistant Geologist, State Bureau of Mines and Geology

With a potential value far in excess of any of her minor industries, the scenic resources of Idaho are at present little known, less exploited and least advertised. With the exception of the glaciers of Glacier National Park and the multiplicity of the geysers of Yellowstone, the boundaries of Idaho enclose points of scenic beauty that equal, and in many cases surpass, any of those to be found in all our national park system. The massive grandeur of the Tetons, the placid beauty of Payette, Coeur d'Alene, Pend d'Oreille and Hayden

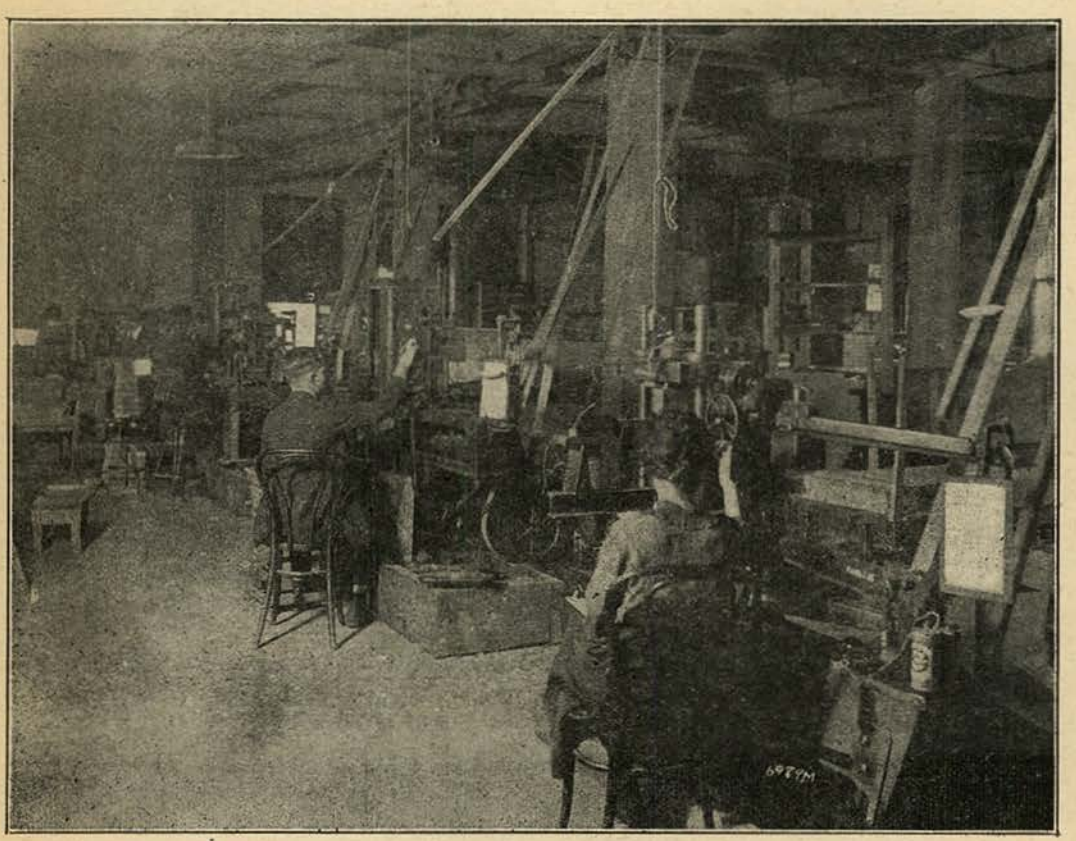


Lakes and the jagged skyline of the Sawtooth Mountains are accessible to some degree to the automobile tourist and are obtruding themselves gradually on public attention. Thoroughly, yet unnecessarily, hidden from the highways and even more deserving of notice, however, is the Grand Canyon of the Snake River and the contiguous area of the Seven Devils Mountains.

Deeper by more than 2000 feet than the canyon of the Colorado, the Grand Canyon of the Snake makes its sinuous northward traverse between the states of Idaho and Oregon. Not a study of brilliant colors comparable to the "Garden of Allah", as is the Colorado, but rather a symphony of delicate tones suffused over a base of dull volcanic rocks, its charm is kaleidoscopic. Its jagged walls, here a blue gray, there of a greenish tone, with a bold, red sweep of iron stain yonder and a jaunty touch of. yellow green lichen at hand, climb 7600 feet from the roaring, foamflecked river to the

towering timber clad slopes of the Seven Devils. Mountains. At mid-day, we see an olive green river, oily in the eddies and backwaters, wild and seething over the rapids, losing itself in the soft lavender haze of July which grades into a deep azure blue overhead. An occasional bench, seemingly a stone's throw away across the river, relieves the regularity of the saw cut canyon with its clump of delicate dark green timber. It is only by glancing at the lofty, yet identical, yellow pine at hand that one retains his proper perspective in the vastness of the place. Again at dusk we stand on the Canyon's brink. Below is a tarnished silver ribbon in the impenetrable blackness of a seeming void which softens to a rich living maroon in the near shadows; opposite us the timber clad summits glow in the reds and yellows of a setting sun. Inadvertently, we drop into a silent speculation of the abstract.

Truly, we of Idaho need not cringingly acknowledge our state and leave the floor for the artificial attractions of the land of the "native son".. The mountains of Idaho, jewelled with untold numbers of lakes set in patches of undying snow, should be the Mecca of pleasure and relaxation-seeking tourists. Advertising only is needed to force the establishment of routes of easy access. Let us foresters, geologists, surveyors, sportsmen, who see and learn these beauties, start the ball in motion; may we create a just state pride by persistently "passing the word."



Timber Testing, U. S. Forest Products Laboratory, Madison, Wis.

FOREST UTILIZATION

A Public Service Rendered by the U. S. Forest Service

By S. V. FULLAWAY
Office of Products, U. S. Forest Service, Missoula, Mont.

The Field

It has been aptly stated that the problem of Forest Conservation, which today stands out as one of the vital economic issues of the nation, must be solved by the two main lines of endeavor, the first is by stopping further devastation thru such measures as will afford adequate protection and regulation of our remaining forests and will put our forest-bearing lands on a permanent producing basis; the second is the curtailment of the annual drain upon the remaining forests by more complete and scientific use of the trees cut, a use arrived at by an accurate knowledge of the properties of the various woods and their economic use. The activities of the United States Forest Service, logically, cover both of these fields. Those in the latter field, that of Forest Utilization, are carried on chiefly by the Forest Products Laboratory at Madison, Wisconsin and the Forest Service Products offices in several of the western districts of the Forest Service.

Congress, recognizing the national importance of Forest Utilization, annually appropriates funds to be devoted by the Forest Service to investigations and experiments to promote economy in the use of forest products and for commercial demonstration of improved methods or processes in cooperation with individuals and companies. The Forest Service seeks to promote economy of use, first, thru learning and making known the actual situation as to demand and supply of all forest products and second, thru investigations to determine how forest products may be put to better service. These two broad phases of the work are designated "Forest Economics" and "Forest Products" respectively. The problems of Forest Products give rise to two general classes of studies; studies of the natural qualities of wood and methods of handling and using it that will give better service and studies of waste and its possible reduction or utilization. Problems of Forest Economics give rise to studies of present supplies, consumption, uses, markets and prices, and are by statistical rather than experimental processes.

The activities of the Forest Products Laboratory fall largely within the field of Forest Products. Those of District Forest Products offices deal with both Forest Products and Forest Economics.

The Forest Products Laboratory

The national need for research in forest products was recognized from the earliest days of the old Division of Forestry. Prior to 1910, due to scanty appropriations, research in forest products was carried on largely in a cooperative way with various universities where Laboratory facilities were available. It became more and more evident that greater facilities for research were necessary. It was also recognized that centralization was essential to the success of the work. As a result, the Forest Products Laboratory was established by the Forest Service in 1910 at Madison, Wisconsin, in quarters furnished by the University of Wisconsin. This was made possible by the efforts of far-sighted men in the Forest Service who realized that, if our lumber and other wood using industries were to keep pace with other branches of our industrial life industrial research in wood was necessary.

From the modest beginning in 1910 with a personnel of approximately 40 people, the Laboratory force had increased to about 80 persons at the beginning of the war. Up to this time, the work was carried on by Federal appropriations and some funds from cooperative work with various manufacturers. During this period, studies were confined to a large extent to determining the fundamental properties of wood. But, altho no marked increases in appropriation were secured, the scope of the work was gradually broadened and contact established with the principal forest products industries.

At the opening of the war, the work and organization of the Laboratory was brought to the attention of the various military and naval authorities. As a result, military and

naval demands for rapid output of reliable data caused an increase of the Laboratory personnel to more than 450 at the time of the armistice. Funds for this purpose were made available by the cooperating departments.

A survey of forest products needs in relation to national defense brought out clearly the vast importance of wood and other forest products in warfare. An attempt to cover the accomplishments of the Laboratory during the war is entirely beyond the scope of this article. Some of the major activities were the contributions in such lines as kiln drying of aircraft wood; work on design of aircraft parts; development of water-resistant glues; airplane propeller work; kiln drying of heavy woods; war time box work; participation in problems of wooden ship building; cooperation with railroad administration; furthering the chemical warfare campaign; wood cellulose for explosives. The value and efficiency of its work had so fully been demonstrated by the close of the war that the expenditures for research work were in excess of $750,000.

Since the war, the Laboratory has been busy applying its war discoveries to peace time activities and developing new lines of research in wood. It has just started in a field of unlimited possibilities altho it is estimated that already the direct savings from its researches have amounted to more than $70,000,000. It is the present personnel, organization, and problems which are now of greatest interest.

The work of the Laboratory is in charge of a Director, an Assistant Director and a staff comprised of the heads of the different research and administrative sections. A sharp distinction is drawn between administrative, service, and investigative work. In this way, research men can give their whole thought to problems in hand. The personnel now consists of some 220 people. The men are recruited from the professions of chemistry, engineering, forestry and pathology, also from the different grades of clerks and skilled laborers.

The technical work is divided among seven sections, each unit devoting its investigations to certain well defined fields. In addition to the research sections, there are four service units carrying on many functions, such as finance, engineering, maintenance, personnel details, etc. Here also is located the office which handles the editorial work. This office is responsible for the general dissemination of the results of all the Laboratory's research. Coordination of research activities is accomplished thru the Director's office.

The Section of Timber Mechanics deals with the mechanical properties and uses of wood. Its problems include those relating to the strength of wood; strength and design of manufactured articles; effect of kiln drying, steaming and boiling, and preservative treatment upon the strength of wood; container construction and methods of packing. The equipment of this section is varied and complete. It ranges from such apparatus as the new million-pound testing machine, which will test the strength of a column thirty feet in height, to machines for testing small clear specimens of wood 2 x 2 x 30 inches. Mention should be made of the two tumbling drums in the box laboratory of the section. The larger will handle boxes weighing as much as half a ton.

Wood treatments and laminated or built-up construction are studied by the Section of Wood Preservation. Wood preservation, problems of gluing, water-resistant glues, and protective coatings for wood are within its field. This section is thoroughly equipped. Among its various equipment is the large pressure treating plant, glue mixing and spreading machines, hot and cold presses and other special apparatus. One activity of the section is of particular interest. In addition to a large number of actual service tests of treated timber, which are inspected at regular intervals by members of the organization, it acts as a clearing house for all such records in the United States, thus making available reliable results based on actual service as to the durability of treated and untreated timber.

The chemical utilization of wood is the field of the Section of Derived Products. Its investigations include those dealing with the production and utilization of products of wood distillation and extraction; chemical composition of wood; oils, gums and balsam; chemical composition and physical characteristics of wood preservatives; ethyl alcohol from sawdust; uses of hydrolyzed sawdust. The usual chemical laboratory equipment with additional specialized equipment are used in this work.

The Pulp and Paper Section is engaged in studies of manufacturing methods and suit-

ability of various woods for pulp, paper and special products. Its work has been focused primarily in determining the value of our different species for pulp and paper. More than 70 different species have been studied. In cooperation with the pulp and paper industry, investigations have been made to determine the methods to combat the tremendous losses which occur in the storage of pulp wood and manufactured pulp due to fungus decay. The equipment consists of apparatus to make wood pulp by any of the commercial chemical or mechanical processes and convert the pulp into paper by cylinder or Fourdriner process. This is of course on a laboratory rather than a commercial scale.

Experimental and applied kiln drying, physical properties, identification and structure of wood are the lines of investigation pursued by the Section of Timber Physics. The underlying fundamentals of kiln drying lumber have been thoroughly studied. Kiln drying schedules have been worked out for a number of important species and two types of dry kilns, one especially adapted to drying refractory hardwoods and the other to rapidly drying softwoods, have been developed. A great deal of work has and is being done on the structure of wood and wood identification. Six kilns of commercial size are operated by the section which also has much special apparatus for its work.

The technical study of the efficiency of wood conversion processes is assigned to the Section of Industrial Investigations. Investigations are made of the methods and practices in the lumber and wood using industries, lumber grades, lumber specifications, mill scale studies and similar problems. One service which the section is rendering the public thru its wood waste exchange, is the bringing together of wood waste producers and wood waste consumers. This whole field of investigations has been exceedingly limited until recently owing to the fact that an adequate organization has not been available.

Pathological work, largely a study of fungi and their effect on wood in its many fields of use, is handled by the Section of Pathology. This is a cooperating office of the Bureau of Plant Industry. Among its many problems are decay of timber, molds and stains in manufactured wood products, and antiseptic properties of wood preservatives.

Obviously, the work of an organization like the Forest Products Laboratory consists of more than the solving of its investigative problems. Of equal importance is the dissemination of the knowledge acquired in a manner which will best aid in the efficient use of our timber resources. Every effort is made to reach the entire wood industrial field thru a variety of mediums. Correspondence, which averages 3000 letters a month, is one of the mediums used. Special reports and articles for publication in the press, trade and other journals are also effective means. Many other methods have also been used. As an outgrowth of the war time activities of the Laboratory, a demand from the industries resulted in the Laboratory offering several educational courses. The two weeks course in the kiln drying of lumber has been given every month for two years. A tuition fee of $150.00 for each student attending is charged to cover the actual costs. Over two hundred men from the lumber and wood using industries have taken the course to date. Five courses are now being given in the western states in order that the western industries may be able to gain the benefits of the course. The course in box and crate construction and design is given at the Laboratory every second month. This is a weeks course for which a $100.00 tuition fee is charged.

Cooperative service is also offered by the Laboratory by means of research service at cost to the industries. The Laboratory is maintained and operated by appropriations made each year by Congress. The appropriations are based upon general estimates of work to be undertaken during the ensuing fiscal year, so that the appropriations for the Laboratory's use must be spent in accordance with an annual program of work. In keeping with the purpose of the Laboratory, it is the policy of the Government to make this program, in so far as possible, one of fundamental research, the results of which will be of the greatest benefit and of most lasting value from a public standpoint.

Recognizing the further opportunity for service, the Laboratory has adopted the policy of undertaking cooperative work up to the point where it can be handled efficiently and without disruption of its regular program of fundamental work. Such service is rendered at actual cost except in cases where

the work is of direct value in furthering the regular research program of the Laboratory. Then the cost is often divided between the Laboratory and the cooperator. This method of service in no way commercializes the work of the Laboratory because all information available on any phase of wood utilization is furnished free upon request or thru personal consultation.

The District Products Offices

While not a part of the Laboratory organization, the work of the Forest Products offices in the western districts is intimately tied in with the Laboratory chiefly thru furnishing a close contact with the industries in these districts. One or more men are assigned to each of these offices and, as is the case with all activities of the Forest Service, handle the wood utilization work in these regions under the jurisdiction of the District Foresters.

As pointed out in the case of the Laboratory, the solution of investigative problems is not the only activity of a properly balanced research organization. The dissemination of knowledge already acquired by investigations in forest products and forest economics is therefore one of the major activities of the District Forest Products offices. In fact, due to the naturally less intensive methods and practices of the industries in the West, this activity is of first importance. Methods of accomplishing this end are many and varied. Some of these followed are: correspondence, including the distribution of literature; interviews both in the field and office; actual demonstrations of practices and processes; articles for the press, trade journals and similar publications; and addresses at meetings of lumber, wood using industry and allied associations.

Another activity is that of investigations in both forest products and forest economics which are of local character. Some are carried on in direct cooperation with the Laboratory. The District Forest Products men also perform the function of representing the Laboratory in the region. Still another is that of maintaining additional contact between the Forest Service and the industries as a result of the close connection this work has to that of the industries.

Assistance and advice to the local National Forest organization are a very important part of the work. This is chiefly in connection with the problems arising from the many forest improvements, which are constructed and maintained by the Forest Service, and the appraisal and sale of National Forest timber.

Aside from the general duties of keeping in touch with the problems of the industries and attempting to promote and secure the most efficient use of all forest products, some of the specific projects carried on by the Forest Products offices should be mentioned. Studies to determine the best practice of air seasoning lumber and current kiln drying practice are of real importance to the lumber industry. Current inspections of actual service tests of treated timber and the initiation of new projects of this nature are building up reliable data on the value of different preservatives and methods of treatment as well as the durability of treated and untreated timber.

The collection of statistics on annual lumber production, lumber manufacturing costs, wholesale and retail lumber prices, log and stumpage prices, and output or time studies of the many phases of logging, are not only of value to the lumber industry but necessary for the proper appraisal and sale of National Forest stumpage. Market studies and studies of the secondary wood using industries are also within the scope of the work.

Practically all the phases of Forest Utilization are gradually receiving the attention of Forest Products investigations. There is much yet to be done as time and funds are available but already there has been acquired a great deal of knowledge which is available to the public. The Forest Service is attempting to spread this knowledge with the resources at hand. The public should also come to the Forest Service with its forest utilization problems.

THE SCIENCE OF SMOKE-CHASING

By C. W. CHENOWETH
Assistant Professor of English

To provide a scientific approach to my problem, I shall first limit my field, and second, my audience. My subject is smoke-chasing and my audience smoke-chasers. I shall not stray out of my field, no others should stray into my audience. My responsibility ends where the reading begins.

Smoke-chasing may be defined as that activity upon which all phases of Forestry rest, the smoke-chaser, as the man whose labor enables all others in Forestry to rest. The first was my reason for going in, the second, for coming out. I went in with a heart eager for adventure. I came out with a head crowned with wisdom. The experiences that accomplished this transfer provide the sole content of this study.

On this account my treatise may well supplement academic curricula. The student who has completed his study of what smoke-chasing ought to be, may here quickly learn what smoke-chasing is.

It must now be apparent that the proposed content is rigidly scientific. It remains to make clear that the contemplated form is equally so. In this connection, attention is directed to the headings, sub-headings, and side-headings, inserted expressly to give a form as exactly analytic as the content is thoroughly scientific.

The Etiquette of Smoke-chasing

The etiquette of smoke-chasing should be studied under three separate divisions, conversation, clothing, and table manners.

CONVERSATION

A man cannot be known by what he says, but everybody thinks he can. What his speech exhibits the man possesses, is a fallacy which might just as well be the truth. Groundless as it is, however, this wide-spread conceit demands caution in conversation. But the caution which is best to advise is hardest to practice, namely silence. Since therefore the best is impracticable, the next best must suffice; ask questions, don't answer them. The man who asks is of course obnoxious, but the man who answers is a fool. The first alternative, is the less of two evils. Therefore think fast and get in the first thrust. "The best defense is a strong offense".

"Well, men, how's business?" will do for an opening. This stroke should be dealt as you swing off your pack and reach for the red bandanna. The character of the question is especially pertinent. "Men" is inclusive and "business" is indefinite. It results from this, that each man knows that the talk is to him, but no one knows what the talk is about. For of the thousand and one things that each man does, not one can be dignified as a business. Their hesitation is your opportunity.

Let it be known at once that you sacrificed a good job to come to the woods, that you love the forest and revel in its wonders. If it can be managed, the ranger should witness this enthusiasm. The effect on him is likely to be favorable, unless other new men have passed through before you. In that case the story is getting pretty old by the time your turn comes. But the chance is worth the risk. The best place that he can give you is not tremendously good, the worst is but very little poorer. The difference between them is in their accessibility to the grub supply. But there are only a few stations on each ranger district to which the pack train is unable to go, where as a consequence, the occupants must thrive on the wonders of nature and such grub as they can pack in on their backs. The worst that can happen is an assignment to one of these; mine were always this kind. Furthermore, if you do exasperate the ranger with your talk, you can be assured that others have done likewise. So that however much he might wish to hang you out on some flimsy fringe of the grub line, he may not be able to do it because of the others already dangling there. If you can keep silent it is best, but if you must talk play for big stakes.

CLOTHING

The power of choice in the matter of dress relates to the "going in", not to the "coming out". But even here, volition is of little value, because it must function with reference to a number of bad options without a single good one. No matter what you wear it is certain to be wrong. The thermometer is

always batting a hundred or else flirting with zero. The batting and flirting will often take place in the self-same hour. It is hopeless to dress for such freakish occasions. Since therefore the selection is bound to be wrong, make it quickly, and the time saved in choosing, may well be used later in cursing the choice.

The baggage, at least, should include a tooth brush and a safety razor; at most, the addition of fishing tackle and ammunition. The latter are luxuries, the former necessities. You will probably use them little, but their possession is an evidence of correct antecedents. Before the end of the first month one's own incredulity will demand such evidence.

In regard to the "coming out" dress there is no opportunity to choose and consequently no chance to go wrong. Whatever can be had will always be right. The majority come out in gunny sacks. The utility of the gunny sack in reinforcing broken down breeches has long been recognized, but its availability for more ambitious ends is a recent discovery. A little work with a jack-knife can transform a gunny sack into a first rate shirt. Since this discovery most men in the woods have at one time or another profited by it. Hence if you can come out with a gunny sack shirt your shoe soles lashed on with emergency wire, your breeches pegged together with a fish hook, and your hat scorched full of large holes you are in correct dress and are likewise lucky.

TABLE MANNERS

Whatever is efficient in this field is good form. Eating and smoke-chasing are inseparable adjuncts, with a preponderance of emphasis in favor of eating. It would be truer perhaps to say that while eating does not depend on smoke-chasing, smoke-chasing does depend on eating. Therefore if smoke-chasing efficiency is desirable, eating efficiency is at least equally so. This conclusion determines the following regulations.

When the cook taps the cross-cut saw, drop whatever you are doing and run for the wash place. Call out in a playful way some pleasantry to your nearest competitor to indicate that you have no serious purpose in running. But it is well to remember that he too is trying for the lead and is devising some strategy by which he may jockey you out of your position. The old timers know that it denotes efficiency to lead a crew up to the wash place and that it connotes disaster to follow one. Anywhere below fifth place in the wash line is inefficient. It indicates that you will either make a quarter-mile trip to the spring for more water or else execute your ablutions in the dregs accumulated from the cleansing of three or four men. The towel by this time will have become wet and odoriferous, so that in the process of washing, you will have exchanged your own dirt for a distilled compund of the dirt of the whole crew. Inefficiency here exacts heavy tribute. Find your place among the first five.

At the table, conversation should be scant. "Want some?", "Uh-huh," and "Huh-uh" are all that is necessary. The words of the question can be articulated with a jaw motion exactly coincident with chewing, the latter phrases may be uttered with the mouth closed. This makes it possible to carry on the necessary conversation without in the least retarding the process of eating. In this way the ends of efficiency are conserved.

After the others get through, make friends with the cook. He is lonely and will be cheered by your attention, you are hungry and may be appeased by the scraps. The advantage of the friendship is thus two-fold.

But tact will be required if the matter succeeds. Cooks are usually sensitive. The slightest bias toward the scraps as against his companionship, will spoil the plan if the cook detects it. Attention to him must appear primary, devotion to the food merely incidental. Accomplishment here gives plenty of food and a way of escape from the odium of gluttony.

Leisure in Relation to Smoke-Chasing

Leisure may be defined as the lapse of time between the end of one job and the beginning of another. It is well to remember that jobs end at the camp as well as begin there. Going to and from work is part of the work and is usually so regarded. Even the ranger himself admits it with reference to those cases in which the worker provides manual transportation for a cross-cut saw, a maul and an ax, two wedges and a peevey hook, a workman is scarcely ever seen with less. Both going and coming to and from work are included in the work. Leisure then may be further defined as that portion of time between jobs which

may, at the option of the individual, be spent in camp.

LEISURE AND EFFICIENCY

The amount of leisure depends on the individual. In a given situation, one man will find plenty, another will find less. Now which is the more efficient?

The answer to this question depends on the point of view. The ranger maintains that the man who finds little leisure is more efficient. But logic is against his claim. For if the man who finds a little leisure is efficient, he who finds much should be more efficient. There is no gainsaying this truth.

But the use of leisure is just as important as the possession of it. Space permits the discussion of only two phases, recreation and amusement.

RECREATION

One of the greatest problems of a smoke-chaser is to improvise a suitable program of recreation. The government has up until now ignored this essential. Nothing is provided, not even the ammunition for the improvement of marksmanship. It is a great tax on the ingenuity of men to supply this deficiency.

Long walks are indispensible on account of their benefit to the leg muscles. These suffer most from inaction. Walking likewise develops the vocal mechanism if in connection with it a coyote howl is cultivated. A proper skill in this vocalization enables one at any time to stir up a chorus scarcely distinguishable from a fraternity serenade.

Now and then a cougar looms up in the trail. That event does not call for an exhibition of marksmanship, on the contrary it means that by the time you reach camp, you will have recreated enough for that day. Agility should be the rule of behavior. The animal, however, must not be neglected. He is almost sure to take up the chase. This will require some additional speed. It is possible to outrun a cougar where the character of the terrain is favorable. If the ground is rough it is more difficult. In that case a shot or two fired into the air may dull the edge of his appetite. But the very act of drawing the gun and firing the shots will perceptibly slow up the runner, hence this expediency is not advised until all the possibilities of speed have been exhausted.

The pursuit must end before the camp is reached. It is considered bad form to rush into camp all winded and covered with sweat. One or two lapses into that sort of crudity may easily spoil a whole summer. First compose the difference with the animal either by sheer fleetness or random shooting, cool off and get wind, then stroll casually into camp and remark indifferently that you saw a cougar down the way. If you fired any random shots, it is well to add that you think you "nicked 'im" the last shot.

AMUSEMENT

Amusement provision and bunk equipment are inextricably bound up together. Amusement is impossible when the bunk is inferior either in workmanship or material. Boughs are good for temporary purposes, but should not be considered for permanent use. It requires too much effort to keep them up. A bed canvass rightly adjusted to two poles, and these in turn to two blocks, can much better serve the ends of amusement.

1. Every lookout station has its old magazines, carefully preserved from year to year. These are always available for the employment of leisure not otherwise occupied. The value of the content of these magazines for the purpose of amusement is uniformly high, the advertisements no less than the fiction. Fiction, scientific matter, cooking recipes, and advertisements should be treated indiscriminately until the memory holds them all as clearly as the magazine does. After that the magazine may still serve the purpose of providing targets for pistol practice. But a conscientious smoke-chaser will scarcely care to deplete the next year's supply in this way, especially when tin cans will serve better.

During the learning process the magazine and the bunk should be kept within easy reach of each other. It is very disturbing, when one is reclining in a posture of relaxation, to be compelled to attempt to secure some article just out of reach.

2. In smoke-chasing nothing more abundantly repays painstaking effort than does observation. Amusement depends on keenness of observation.

With any tent, however carefully constructed, there is always an impressive flock of insects trying to get out and an equally impressive number trying to get in.

The habits of the two groups are entirely dissimilar. The components of the first group are grasshoppers and bumble bees. They are

always trying to get out. The components of the second group are "no-see-ums" and mosquitoes. They are always trying to get in. This second group has capacities that may become interesting but never amusing. It remains then to examine the possibilities of the bumble bee and the grasshopper.

Between these two again there is a divergence of behavior. The bumble bee on the one hand is always in motion. The rapidity with which he rushes from one position to another in search of an opening renders it necessary for the eye to function with an equal rapidity to keep track of his explorations. When he does finally escape the reaction from the eye strain assures to the observer a restful sleep.

The grasshopper on the other hand assays his task differently. Instead of the random gyrations he makes none at all. Like a chess player his moves are chronologically disparate, one follows the other but the interval is uncertain. On one occasion I observed a grasshopper in the same position for a period of five hours. During this time neither of us moved, except that at the end of the third hour I noticed a slight curvature of the left antenna and a backward stretching of the right hind leg. After some minutes, however, the contemplated move was discountenanced and like a chess player the grasshopper again relapsed into meditation. There was no recurrence of that behavior nor indeed of any behavior during the remainder of the period. At the end of five hours, the duties of my station interrupted the experiment.

I prepared and consumed a satisfactory meal and, ninety minutes later, returned to the observation. The specimen was still occupying the precise position in which I had left him. Taking up once more my station of the morning, I prepared to renew the investigation, but a gradual dulling of the senses ensued, followed shortly by a complete loss of consciousness. When I awoke some two hours later he had jumped. But incomplete as it was, this much can be deduced from the observation, in any situation where a good bunk is present even an insect can furnish amusement.

3. A third amusing phase of smoke-chasing is the meditation of the smoke-chaser. It is possible to point out but one or two sources of this pastime. The first is the insoluble enigma of the correct menu for the next meal. At first this problem is difficult, as the season advances it becomes increasingly so. This results from the diminishing food supply and the surfeiting appetite. There are possibilities of unlimited preoccupation in the question.

Then, second, there is the question of getting water up the hill without going down the half mile of perpendicular steep to fetch it. In the end the trip must be made. But before recourse is had too that expedient, much amusement may be had from a consideration of the possibilities of a gasoline engine and a water pump.

Labor Saving Devices

The reference here is not to the invention of machines but rather to the invention of ideas. The invention of a machine may save some labor but the right idea saves it all. A device which converts work into something that is not work saves labor. Fishing is the best method of cruising timber. Hunting is an effective means of locating new trails. Each of these activities treated alone is work. In the suggested combination each is a pleasure. The combination thus saves the labor. A labor saving device then may be defined as a scheme which reduces the effort of the worker without affecting his apparent output. By effort I mean what the smoke-chaser does, by apparent output, what the ranger thinks he does. By these definitions it is clear that the relation between effort and output will largely be determined by the smoke-chaser's report.

RECORDS

To be a labor saving device the diary of a smoke-chaser should be a code of ethics in the sense that it records what ought to have happened rather than what actually did. This end can be achieved by none but the master of phrases.

There are certain phrases that will accomplish as much as a hard day's work. Among them may be mentioned "fire-prevention", "work in camp", and "trail location". These summarize the activities in which the ranger is most interested. It requires no effort, or scarcely none, to put them in the record and their presence there assures the ranger that the output is all right. They must, hence, be regarded as great labor saving devices.

FIRE LOCATION

In the Fire-Fighters Manual there is a regulation requiring the smoke-chaser to be in progress toward the fire ten minutes after it is reported. This regulation would work a great hardship if it were not for the fact that the man who progresses likewise reports. It results from this that fires never start in the evening. It is otherwise with a beginner. For him every smoke is a fire regardless of the time when, or the place where it starts. But for the old timer no smoke is a fire unless it shows up in the morning, nor is it one then if there is the slightest chance of another one springing up in an easier place to go to. Great labor can be saved in skillful fire location.

HIKING

In spite of his inclination to the contrary a smoke-chaser will do considerable hiking in the run of a season. The great criticism of the forestry service is that when a man goes into it he must carry his own transportation facilities with him. This defect is notable in connection with smoke-chasing. Any kind of conveyance, even a prospector's donkey would greatly lighten the burden of the smoke-chaser. But even such modest provisions are lacking. Prospecting is thus a more favorable profession than is smoke-chasing. A prospector goes looking for something he wants and a donkey bears his burden. The smoke-chaser goes searching for something he doesn't want and carries a pack with him that would stagger a donkey. The smoke-chaser hikes and packs, the prospector just hikes. One finds what he is looking for about as frequently as the other. But the great point of similarity between them is in the hike.

Hiking may be divided into two classes, on a trail, and off. The first is difficult, the second is more so.

1. Hiking on a trail is difficult for one reason, because the trail itself is capricious. If it is on top of a mountain it will zig-zag down at every opportunity. If it is in a canyon it will angle up on the slightest provocation. It can be counted on, however, to go straight up over the top of the highest mountains and straight down over the roughest brakes.

The theory carried out in trail construction is that if the worst places are made accessible by trails, the best can be reached without them. But while this theory justifies their location on the worst ground it does not make the trails any the less difficult to travel. To the hardships of the trails must be added the weight of a fifty pound pack. This combination is bad but the smoke-chaser endures it mainly because the other alternative is worse.

2. Hiking where there is no trail can have but one consequence, sooner or later the hiker is lost.

In an emergency like that a compass is useless. I have frequently felt that I was lost just a little and found on consulting the compass that I was lost a whole lot. Instead of one error I was confronted with two. The sun in such cases becomes a poor mediator. If the fancy possesses it, it will set in the north with its usual complacency. When the sun shows a tendency to set in the wrong place and the needle persists in pointing due east, it is always best to make camp. Things won't right themselves over night. But if one must strike a compromise between a derelict compass and a recreant sun on the one hand and his unsupported conviction on the other it is well to begin in the early morning.

FIRE FIGHTING

A smoke-chaser is expected to handle any fire that does not cover more than an acre. But a fire of even that size can make a lot of labor. For this reason it is better to take it while it is yet very small or else wait until it gets larger.

The second alternative has several advantages. It is possible that the fire may go out while you wait, that some one from a neighboring sheep camp may put it out, or that it may get so big that a fire crew is needed. If any of these possibilities materialize, the smoke-chaser's responsibility with that fire is ended. His wisdom has saved him great labor.

But there are fires that will neither go out nor get bigger. Fifty per cent of all that start in a smoke-chaser's area will come in this class. Of this number one-half will be handled by sheep herders and freshmen smoke-chasers from contiguous territory. This will leave twenty-five per cent of the total number of fires to be managed by the resident smoke-chaser. His versatility will be taxed to overcome the labor of going to them, and the hardships involved after he gets there. In this there are devices that must not be ignored.

The labor of hiking is partly determined by the weight of the pack, consequently a reduction in weight entails a corresponding reduction in labor. But the process of reducing must not affect the quantity of the bedding or grub. The only alternative is to get rid of some tools.

Each man is expected to carry a shovel, an ax, and a grubbing hoe, a total of six tools for two men. Four of them can be dispensed with at once. One ax and one shovel will serve for both. This foresight will save the labor of carrying more than is needed and will likewise save the tools which would otherwise be thrown away.

When nearing a fire the approach should be cautious. Haste may entail the neglect of a camp site. An inferior camping place means a disappointing fire. A good camp and a bed already prepared are the best second line of defense in fire fighting. Before a single move is made toward the fire, one should cook, eat, and sleep. After that if it seems feasible he may trench in the fire. But on no account should the exertion be excessive. Many men are now concerned in making two trees grow where formerly there grew only one. But no one is concerned in salvaging the smoke-chaser when once exertion has depleted his resources. His hope, therefore, is to evade the scrap heap by avoiding the exertion. Every act should be influenced by this consideration.

This summarizes smoke-chasing from the standpoint of the chaser. It may well be guessed that if the same story was written from the standpoint of the ranger, the government, or even the public, it would have but little resemblance to this. But the angle of observation makes a very great difference. The smoke-chaser who gets lost in some other point of view when his own is now clearly defined has himself to blame for the consequences.

TWO BY TWICE

In the faraway, on a summer day
And a mountain trail would do
Just a little trail, above the vale
And wide enough for two.

Peaks tower high against the sky
The sky all clear and blue
Pine trees tall, and a water fall
And room enough for two.

A little lake at the rocky gate
And a little birch canoe,
Splashing trout, that we pull out
In the barque built just for two.

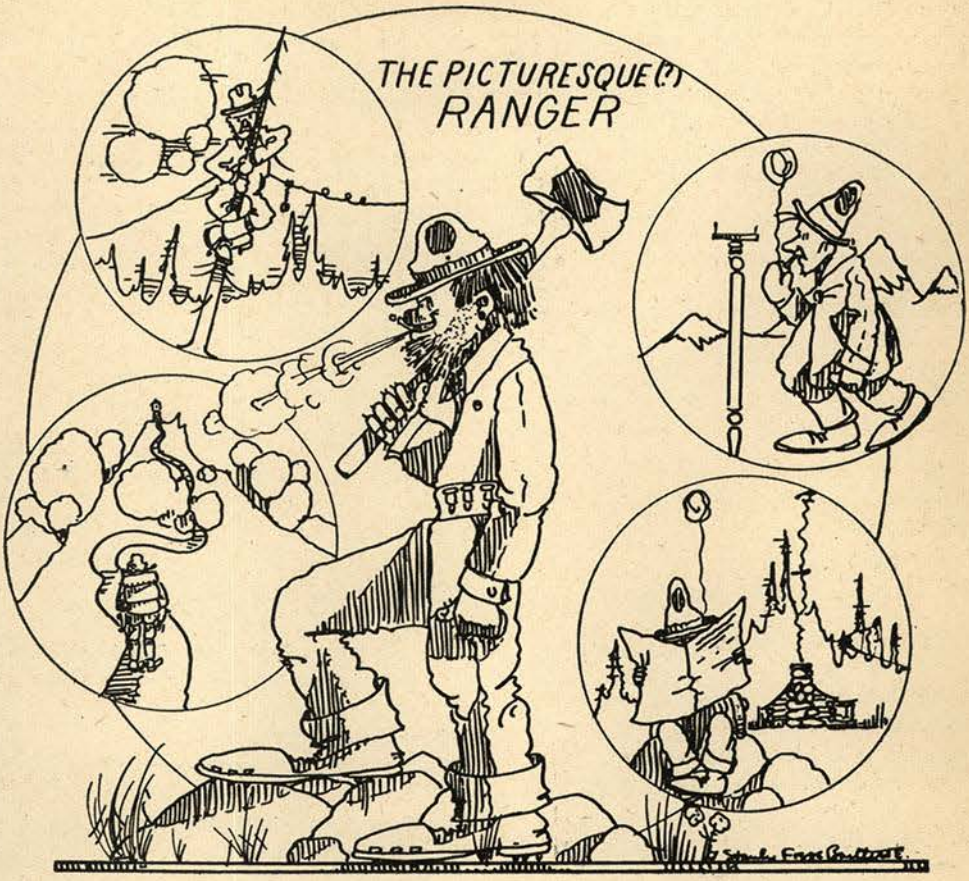
A sandy shore, ne'er touched before
We'll beach our white canoe
On the carpet brown, where cones fall down
We'll pitch our tent for two.

Birds and bear and flowers are there
And the things we love to do
We'll live to love as they do above
In the shrine meant just for two.

A little blaze to Vesta's praise
Bacon, bread and stew,
We'll live and bake for our stomach's sake
Just grub enough for two.

The moon rolls up from its crimson cup,
The sounds are clear and few.
We'll spread the coals and blanket rolls;
In dreamland—just we two.

Stanley Bartlett.



THE PICTURESQUE RANGER

By STANLEY BARTLETT,

He wasn't much on "movie" stuff,
He looked just kinder hard.
He packed a gun,
But not for fun
And held the world in disregard.

He didn't wear a great big hat
O'er his abundant hair
Or 'round his throat
A fur-lined coat,
To drown the words that he did swear.

He didn't sport a snappy suit
Of kippy forest green;
His shirt was torn
By burdens borne,
Tho' it was patched and fairly clean.

His dancing pumps were hobnailed boots
That tripped o'er miles of trail;
His cane (you'll laugh)
Was a Jacob staff;
He measured men with a Scribner scale.

When noon came around 'most any time
He grabbed a hunk of cheese,
A piece of tack
From a gunny sack
Then made his old pipe wheeze.

His literature was bulletins,
His "day of rest" reports,
He marked the pine
And fixed the line,
And played some other little sports.

From his blanket 'neath the starry sky
To dawn when birdies sang
He gave a cuss
That most shocked us
And damned the government to hang.

He's something like a hobo
And he's something like a king,
But you'll admit
That he is IT
Up on the peaks where breezes sing.

The Rangers rave about their life,
The hardships that they bear,
The awful tale
Of camp and trail
And days and weeks of work and care.

But when it comes to burdens
To sweat and cuss and grind,
They'll hit the spots
And cut 'cross lots
If they leave the student far behind.

If a guy's a forest student
The B. A.s at the "U"
Turn up their nose
At his hard boiled clothes
And the smell of his mulligan stew.
They say he smokes a big, strong pipe
And carries matches too,
Chews black snoose
And spits the juice;
Of course it can't be true.

But now, to illustrate a bit,
How much he has to do,
Without offense
I'll just commence to numerate them off
to you.
In botany he gets cross-eyed
From looking thru a glass
At cells and roots
And cactus shoots
And gooey messes in a mass.

He speaks two languages you know
The one is called profane.
The other slang
Of the forest gang
That gives the English "prof." a pain.

He knows how to "guy" a fungi,
And beat a beetle too,
Or roll a tape in decent shape,
And find a corner right and true.

If he can't scale a cat-face
Or estimate quite fair,
He'll show some "pep"
And watch his step
When he recites to Mr. Behre.

If he can't tell a slippery elm
From hickory that's tough,
I'll bet six bits
That Dr. Schmitz
Will catch him in his bluff.

If he's learning how to draft a bridge
Or how to graze a shoate,
Or how to know
Where treelets grow,
He's after Mr. Watson's goat.

Oh, these aren't half the trifles
He meets with every day,
As the awful squall
Of Mr. Fall
Who wants the world to think his way.

And when the year is finished,
And there's no more banks to rob,
He finds relief
From the strain and grief
And asks Dean Miller for a job.

THE FOREST RANGER

His throne, a lofty mountain peak,
His realm, the country 'round,
His joy, the bursting sunsets
His life, what God sends down.
His law, the law of the great out-doors,
His power a mighty force.
The trust of God and man combined
With service as its source.

Stanley Bartlett

SOME IMPORTANT FORESTRY PROBLEMS OF THE INLAND EMPIRE

By C. EDWARD BEHRE
Associate Professor of Lumbering

The enormous amount of discussion and thought which has been devoted to the need of a forest policy for the nation during the last three years has begun to bring results which represent great forward strides for forestry in this country. But encouraging as these beginnings are, the discussion and study of the past few years have emphasized the necessity of solving certain fundamental problems if progress toward real forestry practice throughout the country is to continue at anywhere near the desired rate.

One of the most far reaching effects of the recent agitation has been the stimulation of public interest in the situation. Congress, the Chamber of Commerce of the United States, and many other prominent national and regional organizations have given considerable attention to the forestry question and with a veritable flood of publicity and expression of opinion in the newspapers, periodicals, and trade journals of the country, the average citizen must certainly be much better informed and much more keenly impressed with the seriousness of the situation and the need for action than at any other period in our history. At the time Roosevelt and Pinchot were leading the fight for the establishment of the National Forests and during some of the subsequent crises, forestry held a prominent place in the public attention, but interest waned with the success of the National Forest system and now requires this new stimulation to grasp the broader problem which deals with securing a rational policy of forestry for all forest lands in the United States regardless of ownership.

Cooperation of Lumbermen

Of more direct present importance in actually producing results has been the effect of the recent movement in enlisting the interest and cooperation of timberland owners and lumbermen in all sections of the country. It seems a paradox, but nevertheless it is the truth, that within the very industries which depend upon the forests for their existence, there has been in many cases an almost total lack of knowledge of what forestry is and still less appreciation of the close relation between lumbering and forestry. Now more than ever before, however, lumbermen and timber owners are thinking about forestry, trying to get the idea of forest production linked up with their viewpoint of forest exploitation and striving with all other interests to arrive at some practical means of assuring the country of an adequate and continuous supply of timber for the future.

Lumbering is a business entirely separate from forestry and naturally enough the lumbermen, who have continually had to solve new and more complex problems in making their own industry successful, have not devoted much of their attention to forestry which seemed entirely outside their sphere of endeavor and interest. The lumber industry has been interested in the removal of logs from the forest and their manufacture at the lowest possible cost and consideration of making provision for a future crop, if thought of at all, seemed to present nothing but an increase in cost of operation without any assurance of return for the effort. As fast as markets would permit, stripping of the ground became more and more complete, on the theory that the more material which could be removed per acre the lower would be the unit cost of improvements and operation, regardless of what the actual differential in cost of handling trees of different sizes might be or of the potential value of portions of the stand for future growth. Wherever brush disposal was required by law, it was carried out with the idea of satisfying the requirements of that law at the lowest possible expense or of abating a menace to adjoining timber but without consideration of the possibility of so handling the work as to serve not only these motives but also to favor the establishment or preservation of a future crop of trees.

A year ago the U. S. Forest Service, cooperating with foresters and lumbermen throughout the country undertook a study of the measures in silviculture and protection necessary to keep forest lands in continuous production and the work and attention which have been devoted to this project have probably done more than any one other thing to

bring before the lumbermen in a concrete way what forestry required and to cause them to consider how their operations may combine the objects dictated by conditions in their industry with the measures which will prevent further devastation of forest lands and so contribute to the permanent prosperity of the country. Men who had been in the logging business all their lives, but had never given any consideration to the problems of forest reproduction, when cooperatiing in the field work with the foresters engaged in the minimum requirements project, became interested, gathered many fundamental ideas, learned that forestry and lumbering were not absolutely incompatible and acquired a viewpoint which looks beyond the present into the future of the forest industries of this country.

To secure the interest and cooperation of the forest industries in formulating for the different forest regions the measures which are necessary to prevent forest devastation and keep the lands productive has been a big step in the right direction but to make progress really effective these measures must be applied in practice. Formulation and discussion of federal and state legislation which will accomplish this has, of course, been at the bottom of all the recent forestry agitation and indeed a definite policy for the country as a whole is essential to the ultimate solution of the problem. But it is a fundamental principle of a democratic government that the government should not interfere in private industry unless the self interest of the industry or persuasion fail to fully safeguard the public interest, and experience has demonstrated that wherever the self interest of industry can be made to conform to the public interest, more satisfactory results will be obtained by private initiative than by government regulation. It is also evident that the difficulty of enforcing whatever regulations it may be necessary to formulate in federal or state legislation will increase in direct proportion to the divergence between public interest as defined in the law and self interest of the industry. That is to say that opposition will be strong and compliance merely nominal in so far as the industry feels that the requirements are contrary to its best interest, but complete cooperation will be secured just as rapidly as the industry can be shown that its interest as well as that of the public will be served by the measures required. Furthermore, progress will be made in securing the adoption of practical forestry measures without waiting for the slow machinery of government to formulate definite policies if the industries feel that these measures will not prevent the profitable conduct of their business, because interest in the forestry question has been awakened and men in the forest industries are certainly as loyal citizens as those in any other group elsewhere.

That this is true has been emphasized repeatedly in the discussions of the past few years, and that progress is actually being made is attested by the plans for forest management being made by operators in many sections of the country and by the willingness of others to try out in a thorough way the measures calculated to prevent further devastation and provide adequate regeneration. Wholesale adoption of more advanced forestry measures, however, is hindered by the presence of obstacles in the form of unsolved problems which may be grouped into four classes—taxation, valuation of cut-over lands, cost of logging large and small timber and future yield of advance growth left after logging. More definite information and assurance along these four lines would give an enormous impetus to the actual practice of fundamental forestry measures.

Taxation

Taxation of cut-over lands and young timber is probably the most serious and difficult of these problems. It is not believed that any change is desirable in the method of taxing the virgin stands, but the general property tax system as applied to growing forests is admittedly unjust and an effective barrier against progress in the practice of forestry by private parties. Students of the problem agree that the solution lies in separating the land from the timber for purposes of taxation, the land to pay a small annual tax and the timber to pay only at the time of cutting or when the value is realized. Timber owners are making some progress toward amelioration of their taxation problems by securing more equitable adjustment of the valuation of their cut-over lands with the local assessors, but final solution of this problem can only be met by legislative action in the various states. To move a state legislature, especially in a heavily timbered state where the situation is most serious, to the point of changing the basis of taxation for a certain class of property is a difficult proposition, and before it can be safely attempted, a thorough analysis of the tax situation in the state should be made in order to determine, the proportion of the total tax burden of the state borne by timber and cut-over lands under the existing

system, how rates on timber and cut-over land compare with rates on other forms of property, what the effect of further removal of timber will be upon tax rates on cut-over lands and other forms of property and how any suggested change in the tax system would affect local and state revenues, both present and future.

Valuation of Cut-over Lands

Next to the discouraging tax situation, the average lumberman is deterred from adopting measures of forestry involving an effort or expense not essential to the conduct of his business by lack of information as to the values which will attach to his cut-over lands by reason of his effort and expense to provide for a new crop of timber upon them. In very few cases is the timber owner ready to go into the business of growing timber, because of the long time element involved and therefore, aside from his interest as a citizen in conserving the resources of the country which cannot be expected to lead him to stand extra costs without hope of return, his only incentive in providing intensive protection or adopting measures of forestry will be found in the assurance that his lands will have an increased value for sale or exchange as a result of his efforts. At present he has no assurance that his efforts will be rewarded in this way for a generally accepted basis for the valuation of young growth has not yet been established and in fact the idea that forest lands stocked with young trees have any value other than that of the land itself is just beginning to gain a foothold in this country. With land exchange legislation increasing in importance as a factor in solving the country's forestry problem values for young growth of various kinds and ages will eventually be established and this difficulty will largely be removed from the path of forestry.

But progress can be made without awaiting the solution of either of these problems if forestry measures can be shown to be profitable to the lumberman either in reducing his costs of operation or in extending the life of his operation without curtailing reasonable profits at present. In order to do this, however, information is required upon the other two problems mentioned above namely, cost of logging large and small timber and future growth on cut-over lands.

Logging Cost Studies

In every stand there are some trees which, because of small size or low quality of material produced, have a stumpage value equal to zero, that is, the cost of logging and manufacturing them into saleable products equals or exceeds the sale value of the products they yield. It is a difficult matter to say just where the line can be drawn on this marginal product for our information is so meagre on the actual difference in cost of handling timber of different sizes. Most operators work on the theory that any tree which will yield a piece of lumber of merchantable size should be marketed because the greater the quantity of material secured per acre the lower will be the operating costs and the charge to be made against each thousand board feet for improvements. Even if certain of the smaller sized trees could not justify the cost of logging if they constituted any considerable portion of the stand, yet it has been argued that they should be cut if they can be marketed at all, because the improvements will have to be borne by the more valuable portion of the stand anyway and the additional cut per acre will serve to reduce the cost per thousand against the whole. Each operator, therefore, has arbitrarily drawn the line on what should constitute a merchantable tree and that there has been no certain criterion of determining whether this line was correctly drawn or not is witnessed by the fact that operators working in different sections but in timber of similar character and with operations of similar magnitude are working on entirely different standards. Only recently has any real effort been made to get actual figures which might be used to decide where the line between merchantable and unmerchantable trees should be drawn. These studies have been in progress for the last few years by the U. S. Forest Service at Missoula, Mont., and the results so far compiled indicate that in practically every stage of logging from stump to product it costs more to handle the material from the smaller trees than that from the larger ones and that in this section of the country loggers quite generally have been reducing their average net profits by removing more material from a given area than that which would return the costs of operation. It even appears that material which will yield a small margin over costs of production might better be left in the woods in many cases, because the average profit per thousand will be increased if that portion of the stand yielding the smallest margin is left behind and the gain made in this way usually more than offsets the increased charge per thousand for improvements

necessitated by the slightly lowered cut per acre served by the improvements.

In many cases the leaving of some trees of seed bearing size upon the ground is essential to the establishment of a new stand, in others the leaving of a certain amount of material near the limit of merchantable size as the basis for a second cut is the essential factor in prolonging the life of a given operation and in general the leaving of material of this character at present will, through increased growth, provide material which may serve to bridge the gap between the exhaustion of the virgin stands and the time when our needs may be fully met by new growth.

It can be seen from this that if better information upon the cost of handling large and small timber under different conditions will indicate that average profits will be increased if trees near the lower limit of merchantable size are left standing the study of this problem will be of tremendous importance in encouraging the lumbermen to leave more material on the ground and in so doing apply what in most cases will constitute some very practical forestry measures.

Growth on Cut-over Lands

Closely related to this problem and equally important in its relation to the advancement of forestry, is the fourth question of how much will material left after logging yield in the future. Conviction that maximum profits may be earned when the smaller trees are left on the ground may interest the operator in their future growth and the advisability of affording them protection and returning to harvest them in a second cut when the virgin material is exhausted. Or, without any further information upon the cost of logging the marginal product, timber owners may be ready to leave more material on the ground and protect it with the idea of making their operations continuous, if they had any reliable information upon how fast this material would grow, and how soon there would be enough to justify another cut. The average operator with timber in sight to keep his mill running twenty to forty years will consider seriously any proposition which holds the possibility of prolonging the life of his operation even a few years, for any increase in the period of operation will reduce the unit charge for depreciation upon his investment. He is not interested in the protection of cut-over lands for their own sake now because he does not see how they can return the money expended upon them, but when he can be shown how soon young growth left on cut-over lands will yield him another crop, and what kinds and sizes of material will be produced in different periods of time, he may be convinced that the practice of forestry affords him the opportunity to prolong his operation indefinitely.

Thus it can be seen that along with our efforts to arouse public interest in the forestry situation and to formulate a rational policy of forestry for the nation, we must not only seek to solve the economic problems involved but also aim to interest timberland owners in the voluntary adoption of forestry measures through studies of logging costs and growth on cut-over lands which will indicate in how far the self interest of the individual runs parallel with that of the public.

THE SCALER'S DREAM

I met a scaler old and grey
  Who told me of a dream he had.
I think 'twas New Year's Day,
  As he was snoozing in his shack
A vision came to view,
  Having seen an Angel enter
Dressed in garments white and new.
  Said the Angel, "I'm from Heaven.
St. Peter sent me down
  To bring you up to glory
And put on your golden crown."
  So the Angel and the scaler
Started up the Pearly Way.
  When passing close to Hades
The Angel whispered, "Wait!
  There's a place I want to show you.
'Tis the hottest in all hell
  Where those who always crabbed you
In fiery torments dwell."
  And behold the scaler saw there
Gyppos by the score and,
  Leaning on his scale rule,
He wished for nothing more.
  Said the Angel, "Come on scaler,
There the Golden Gates I see."
  But the scaler only murmured,
"This is Heaven enough for me."

IDAHO TIMBER SALE POLICY

By F. G. Miller, Dean

The State of Idaho controls upward of 700,000 acres of timber lands. These are part of its original land grant made by the federal government, mostly for the benefit of the educational institutions—the public schools, the normal schools and the university. This timber area will be increased by more than 100,000 acres by the recovery on the part of the state that part of its grant within the unsurveyed portions of the national forests. This will be brot about by exchanges now under way with the U. S. Forest Service. The 700,000 acres carry ten billion board feet of merchantable timber, valued at thirty million dollars.

The management of the state grants is vested by the constitution in a state land board consisting of the governor, attorney general, secretary of state, state auditor and superintendent of public instruction. The admissions bill prescribes that the proceeds from all lands granted for educational purposes shall constitute a permanent school fund, the interest only of which shall be expended in the support of said institutions. By far the greater portion of these timber lands are better suited to timber production than to any other use. If rightly handled, they will not only yield the first thirty million dollar endowment, but will keep adding to that endowment continuously.

It is to the credits of those who have been charged with the handling of Idaho's land grant that so large a proportion of the state timber wealth is still intact. In particular is credit due those officials who in recent years have worked out and adopted a definite plan of management for these timber lands, calculated to keep the non-agricultural portions in continuous forest production.

This policy is exemplified in the terms of what is known as the Big Creek Timber Sale in Bonner County, made to the Diamond Match Company in 1920. This sale, comprising one hundred and seventy-five million board feet, mostly western white pine, is the largest the state has ever made. The sale excludes white pine timber under fourteen inches, two feet from the ground and all trees of other species under twelve inches. All timber to be left shall be protected from injury during the logging operations, and as cutting progresses, the brush shall be piled and burned in such manner as not to damage the young trees left. It is particularly stipulated that no broadcast burning shall be permitted. It is also provided that certain white pine trees over 14 inches in diameter, where needed for seed trees, shall be left standing, and otherwise the sale is administered according to approved forestry regulations.

This policy is applied in all state timber sales, and in adopting it the Board of Land Commissioners has placed Idaho in the lead of all the land grant states in the scientific handling of its timber holdings.

PROGRAM

Out of bed at eight o'clock,
Wash my mug and dust my frock
Eat breakfast with some foolish talk
And hope.
Late to class at after nine
Do my quizzes up darn fine
Sling the Prof. a slippery line
And pray
Dinner, supper, books at ten
Study like the deuce and then
Write this with my fluent pen,
Oh Boy!
Thus I kill the passing day
Lost! and flying on its way
Guess I'd better hit the hay
And Sleep.

Stanley Bartlett.

WHY HARDWOODS DO NOT GROW NATURALLY IN THE WEST

By J. A. LARSEN
Priest River Forest Experiment Station

The association of men and trees dates back past the dawn of history. Many writers maintain that the prehistoric ancestors of our race lived in the forest altogether. Certain it is that as soon as the human race emerged from the forest, began to plow and sow, build cities and factories, they must have missed the magnificent trees which gave them shade, shelter, fuel, and material for weapons and tools, for they planted trees and shrubs around their habitations where none existed before.

To-day our need and desire for trees and for the forest is as strong as ever. We turn instinctively to the forest for recuperation from past work and inspiration for the new tasks. A home or farm without the graceful sweep of green, leafy crowns is a picture of grim poverty. Trees are needed to give a snug and restful effect. Trees and shrubbery increase the comfort as well as the value of property.

Unfortunately the beautiful hardwood trees which are native to the Eastern states do not grow naturally in the West. We have here only aspen, cottonwood, small birch, hawthorns, cherry and alder. On the Pacific Coast are oak and maple but limited largely to lower moist sites such as stream beds and canyons. The general absence of broadleaf trees in the West is most likely due to the difference in precipitation and temperature between the East and the West. To be sure, there are other factors which limit the distribution of trees such as soil acidity, alkalinity, soil and atmospheric moisture as well as inherent qualities in the plants themselves. Soil acidity and soil moisture or quality of the soil, can at best be of significance only within a limited area, and since it has been shown, except for areas near the sea, that atmospheric moisture varies according to the precipitation, it is only a result and as such not a controlling factor. Internal structure of leaves and stems, ability to transport much water, injuries by frost, etc., must be looked upon as direct results of the plant's environment rather than factors which control their distribution. There remains, therefore, the factors of temperature and precipitation and the variation and extremes of these worthy of consideration.

Air temperature, though it may not in all cases be a controlling factor, often limits the distribution of trees either by too short, too cold summer weather and frosts during the growing season, or by too great extremes. Experiments have shown that the leaves of trees do not become green in temperatures above 104 degrees fahrenheit and do not function below 40 degrees Fahrenheit. Unusually low temperatures may cause root killing, bark and wood splitting and killing of buds and stems of hardwood. If the growing season is too short the species which are introduced from a warmer climate bud out too early in the spring or have no time to form sufficient wood in the new stems to withstand frost injuries in the fall. If the nights are too cold throughout the summer months, one of the plant foods, sugar, which is not injured by freezing, has not had time to form before the cold weather sets in. The plant food is therefore chiefly in the form of starch which is damaged by frost.

From the standpoint of water requirement of trees it is well to note that the structure of the leaves, stems and wood of trees may render some entirely unsuitable for certain climates, especially in regions characterized by dry summer air and low rainfall. Deciduous trees are able to transport much more water than conifers. Dr. Franz R. von Hohnel of the Austrian Forest Experiment Station determined by careful tests over a period of 12 years that one acre of oak forest lost by transpiration from 2,227 to 2,672 gallons of water per day during periods of growth. This is equal to 2.9—3.9 inches of rainfall per month for the growing season—much more than occurs over the western sections of the United States. Other broadleaved trees are much like oak in respect to evaporation of water.

An examination of the distribution of hardwoods in the Eastern states shows that

their general northern limit follows a line through St. Paul, Minn. to Eau Claire and Sheboygan, Wis., Grand Rapids, Lansing and Detroit, Mich. North of this line the forest is predominantly coniferous. From Detroit to central New York an inversion occurs in that the hardwoods are on the north and the conifers to the south. This is evidently due to low land and relatively warm air surrounding the lakes and the higher land with colder air to the south. From central New York the line goes northeast through western Massachusetts, through Concord. N. H. and Augusta, Me. with conifers on the north and hardwoods to the south. The westward extension of the hardwoods is defined by the Mississippi River from St. Paul to Rock Island, Iowa, thence southeastward through Iowa, Kansas and Oklahoma, irregularly, according to local variations in topography.

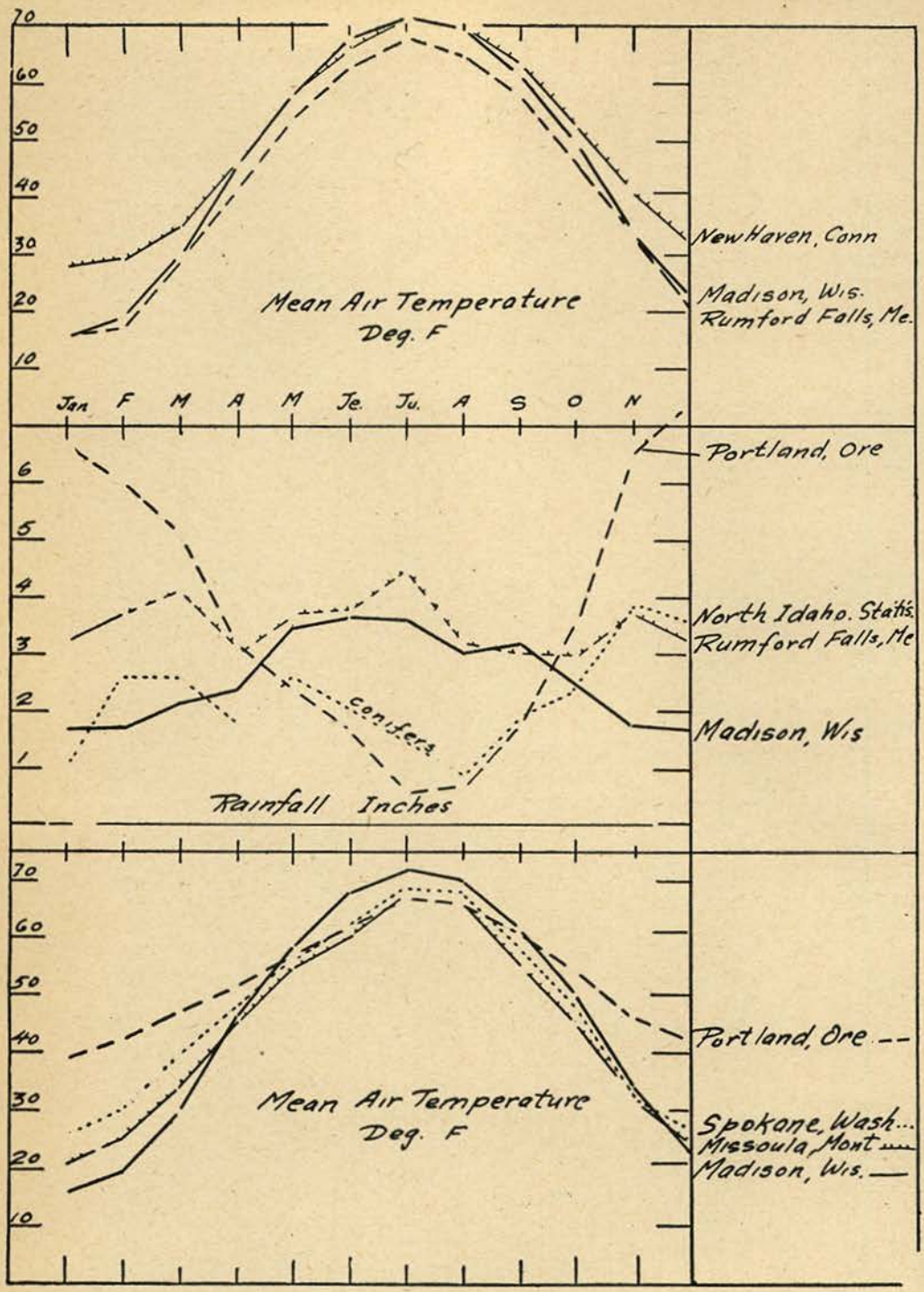
A study of the weather data for stations in the coniferous and the hardwood belts, published by the U. S. Weather Bureau, shows no sufficient differences either in the total, annual, or the monthly distribution of rainfall, or in the amount of snowfall, to produce these results. One would naturally expect to find a greater rainfall in the hardwood area but the opposite is often the case. The precipitation for Rumford Falls, Me., and Portland, Me., are both close to forty inches. The first is within the coniferous forest and the second is known for its Waverly oaks. Keene, N. H., is chiefly coniferous and has an annual precipitation of 40.4 inches, while New Haven, Conn., within the hardwood belt, receives 47 inches. Similar comparisons for more western stations in the two distinct forest belts lead to the conclusion that precipitation is not the deciding factor in restricting the northward extension of deciduous trees.

Low precipitation, however, appears to prevent the westward extension of hardwoods and conifers alike in Minnesota and Iowa, and it seems that the hardwood forests in Minnesota require at least 28 inches of annual precipitation, regardless of the monthly distribution. Madison, Wis., and Davenport, Ia., both in the hardwood type, show respectively 31.9 and 32.9 inches annual precipitation. St. Paul, Minn., on the borderline between hardwood forest and prairie, has 28.6 inches and Sioux City, beyond the natural westward extension of forests on uplands, only 25.5 inches. This last amount seems therefore to impose the limitation in that region.

In respect to air temperature, it is found that at Rumford Falls, Me., Crookston, Minn., Cooperstown, N. Y., etc., places within the coniferous belt, or at least more coniferous than deciduous, the mean annual air temperature is not above 45 deg. F., and for July and August it does not exceed 68 or 69 deg. F. In the hardwood belt the annual temperature is everywhere above this. Portland, Me., and Madison, Wis., show 46 deg. F., New Haven, Conn., 50 deg. F., and in July and August the mean air temperature for these places goes above 69 deg. F. Another very significant difference is found in the longer frostless seasons in the hardwood than the coniferous belt. In all cases, data for stations in the hardwood forest belt show absence of frost in May, June, July, August and September, while stations in the coniferous belt show frequent killing frosts in May and September. From this it appears that a low air temperature and prevalence of frosts in late spring and early fall, rather than differences in precipitation, are restricting the northward extension of hardwoods in the eastern United States. (See following table for differences in length of frostless season for hardwoods and conifers, and for stations in the West).

Average Date of Last Killing Frost in Spring and First Killing Frost in Fall
(Bulletin Q, U. S. Weather Bureau)

	Spring	Fall
Hardwood Region		
Portland, Me.	April 14	Oct. 18
New Haven, Conn.	April 20	Oct. 17
Detroit, Mich.	April 28	Oct. 9
Madison, Wisc.	April 21	Oct. 17
St. Paul, Minn.	May 6	Oct. 6
Coniferous Region		
Rumford Falls, Me.	May 15	Sept. 20
Keene, N. H.	May 16	Sept. 10
Cooperstown, N. Y.	May 7	Oct. 1
Crookston, Minn.	May 19	Sept. 18
Western Stations		
Helena, Mont.	May 11	Sept. 24
Missoula, Mont.	May 30	Sept. 5
Spokane, Wash.	March 21	Oct. 12
Portland, Ore.	March 17	Nov. 16
Pocatello, Idaho.	April 10	Oct. 11
Boise, Idaho .	May 3	Oct. 24
Baker, Ore.	June 1	Sept. 26
Moscow, Idaho.	May 10	Oct. 2



Climatic records over the Great Plains' section of Wyoming and Montana show insufficient precipitation for trees of any kind. As is well known the conifers grow mostly at higher elevations, and cottonwoods and willows along the streams. The annual precipitation at Miles City is less than 14 inches, and that for Helena and Great Falls, closer to the Rocky Mountains, only 15 inches. However, the air temperature curves for the low Mon-

tana and Wyoming Great Plains' stations, and the presence of the more hardy broadleaf trees, indicate that these can be raised there provided sufficient water is supplied. At stations above 4500 feet elevation, and at the more northern points such as Great Falls and Havre, the severe spring and fall frosts, very low winter temperatures and short growing seasons, would aside from insufficient moisture, impose very effective barries to most hardwood species.

In the Flathead and Bitterroot valleys, at elevations around 3000 feet and slightly under the influence which the Pacific Ocean exerts over the climate of the Northwest, air temperatures are more moderate than in central or eastern Montana, but precipitation is much deficient and broadleaf trees cannot be raised without watering.

Points to the west of the Bitterroot Range at elevations of 1500 to 3000 feet show even warmer atmospheric conditions and less frost than the Montana stations. The same holds for the central and southern Idaho stations such as Boise and Pocatello, and in this region temperature conditions are not unsuitable for hardwoods. The precipitation, however, is undoubtedly insufficient. Spokane receives only 18 inches, Moscow, one of the most favorable in this respect, receives 25 to 27 inches; Burke and Murray, which lie above 4000 feet elevation, have as much as 40 inches. There are no hardwoods growing naturally in this region. The reason is unquestionably due to the very low summer rainfall, the accompanying low humidity and the drying winds from the Snake River desert region. This climatic condition is explained by the fact that the northwestern states partake of the Pacific Coast type of precipitation which shows a high winter and low summer rainfall, and because much moisture is taken out of the westerly winds by the Cascade Range.

On the Pacific Coast the air temperatures, except for the higher elevations, appear very favorable for hardwoods. This belt is so close to the ocean that even though the summer rainfall is in most places lower than in the Inland Empire the relative humidity in summer is greater. Portland shows a relative humidity of 45 per cent in July and August, and Spokane only 25 per cent. In spite of this fact hardwoods are not found generally on the Pacific Coast. It is interesting, however, to note that many eastern hardwoods in Portland and other owns in the Willamette Valley in Oregon show excellent growth and development, among these maple, elm, chestnut, black walnut and tulip. This is evidently in a large measure due to the favorable temperature and absence of frost during the growing season, the moist air from the ocean, prevention of loss of soil moisture by the pavements and additions of water by sprinkling and water from washing of the streets.

The comparison of climatic conditions for eastern and western United States shows that for most of the cities and farming areas in the West the air temperature is favorable for hardwoods, but the precipitation and air moisture, and therefore soil moisture, are deficient for these trees. Fortunately the experiments with shade trees prove that this deficit in rainfall may be made up to a large extent by watering. Most of the towns of this region already show a pleasing variety of deciduous shade trees, particularly Norway and red maple, white and cork elm, black locust, European birch, hackberry, honey locust and some red and black oaks. Towns with more favorable air temperature, such as Boise, Salt Lake and Ogden, boast of walnut, chestnut, linden, sycamore, osage orange and white oak. Missoula, Montana, has European birch, Norway and red maple, black locust, white elm and cork elm, green ash, American linden, several oaks, and one somewhat stunted chestnut. Spokane, Coeur d'Alene and Sandpoint have a greater variety. The last two cities have less frost in May and September than the surrounding country because of the influence of the lakes. It is necessary, however, to water the trees abundantly, for wherever the owners moved and left the trees unwatered the trees died. Even in spite of heavy watering certain trees die during unusually dry summers.

Experiments with a great many varieties of eastern hardwoods at Priest River Forest Experiment Station on logged white pine land in northern Idaho are of interest also in this connection. The plants are set out from 1912 to 1914. The air temperature is on the whole lower in summer than within the hardwood region in the East, and the summer rainfall and relative humidity very much lower. Frosts have occurred every month during the summer and the growing season is very short. While a great many species, have been proved too sensitive for planting within the white pine

region in Idaho the results with the following indicate that they will grow within the yellow pine forest region or on warmer sites provided they are watered; red maple, white ash, red oak, white elm, black cherry, hazel, boxelder, European birch and Chinese elm. It is in all cases necessary to protect the young trees from heavy sod competition, gophers and cattle.

Success without irrigation has been obtained with the following species by the University of Idaho forest school at Moscow, Idaho:

Norway maple, sugar maple, sycamore maple, silver maple, black locust, white elm, white ash, yellow birch, black walnut, red oak, burr oak, and box elder.

The plantations at Moscow, Idaho, which were begun by Dr. C. H. Shattuck in 1911, are on the north side of one of the typical Palouse hills. The elevation is 2569 feet, the annual precipitation 23 to 27 inches, with less than two inches for July and August combined. The frostless season is May 10 to October 2 and the average annual air temperature, 46 deg. F. Professor F. W. Gail has found that there is a remarkable difference in climatic conditions on the exposed and the sheltered sides of these hills. Measurements show that the wind movement on the southwest aspect in July and August was 27 miles per hour, and on the northeast aspect only one mile per hour. Consequently the reduced transpiration and lesser loss of water from the leaves of the trees on the northeast than on the southwest aspect must be a great help in the establishment and growth of eastern hardwoods.

In conclusion it may be said that precipitation and atmospheric moisture over the western United States are insufficient for the eastern hardwoods. Air temperature is suitable in most towns and cities and over extensive farming sections. This makes it possible by irrigation or by planting in certain very favorable sites such as moist slopes and aspects sheltered from the driving summer winds, to raise eastern hardwoods in the Pacific Northwest. Except for southern Idaho and the Pacific Coast cities, however, the frequent frost which occurs over most of the region during late spring and early fall are a serious drawback which stunts and kills back the young trees and retards growth on the mature trees.

FOREST PROTECTION WEEK

By proclamation of President Harding and of Governor Davis of Idaho, the week of April 16-22 was designated as Forest Protection Week and through the work of a special committee appointed by the Western Forestry and Conservation Association for Idaho, cooperating with the U. S. Forest Service, no opportunity was lost of bringing home to every class of people in the state the importance of public support in forest fire prevention and individual responsibility in seeing that no fires originate through carelessness.

A program for use in the schools of the state which consisted of a series of short papers dealing with various phases of forest protection was prepared and printed through the generosity of the North Idaho Forestry Association with each article on a separate sheet to facilitate the assignment of readings to the students taking part in the program. Twenty-five hundred of these programs were placed in the hands of school teachers, ministers and Boy Scout masters throughout the state. In addition to this, a circular letter pointing out the importance of the forests to the people of Idaho and asking for cooperation in making fire prevention a success was sent to 64 Chambers of Commerce, 12 Rotary Clubs, 104 American Legion Posts, 13 Elks Clubs, 38 Farm Bureaus, 103 Federated Women's Clubs, 22 Labor leaders and 3 chapters of the National League of Women Voters in the state.

Short addresses were made in every important town by members of the U. S. Forest Service or others before civic and social organizations of various kinds. The newspapers of the state were supplied with specially prepared feature stories and in many towns attractive window displays featuring fire prevention and fire fighting work were shown by the merchants.

Dean F. G. Miller served as chairman of the committee for Idaho with W. D. Humiston and Harry C. Shellworth as subcommittee on Advertising; C. K. McHarg and F. S. Baker as subcommittee on press; Henry Schmitz, Miss Ethel Redfield and C. W. Watson as subcommittee on school program and C. E. Behre and Ben E. Bush as subcommittee on speakers.

THE SCHOOL OF FORESTRY IN 1921-22

By F. G. MILLER, Dean

It is gratifying to record another successful year for the School of Forestry—a year not only of continued growth in numbers, but one of the increasing activities looking toward the betterment of forest conditions in Idaho. The past summer gave an opportunity to make a number of needed improvements about the School. A large, well lighted laboratory was especially fitted up for the classes in drafting and mapping and considerable new equipment for field and class-room instruction has been provided in the course of the year.

Dendrology Laboratory Class

New Instructor

The teaching force has been greatly strengthened by the coming of Clarence W. Watson to take charge of the work in silviculture and grazing. These are both very important fields in Idaho, and Mr. Watson is unusually qualified to develop them. After taking the degree of Bachelor of Philosophy from Yale University in 1916, he spent sixteen months in war service with the Engineers in France, and on the signing of the Armistice was given a government detail for further study in Paris. Returning to the United States, Mr. Watson reentered Yale University and graduated from the School of Forestry in 1920, with the Degree of Master of Forestry. The year of 1920-21 he studied forestry in Sweden on a scholarship award from the American-Scandinavian Scholarship Exchange, specializing in forest management and silviculture.

Enrollment

The resident enrollment in the School of Forestry for the year has reached a net total of 75. Of this number, 3 are registered as graduate students, 41 in the full four year courses, 21 are unclassified, and 10 enrolled in the ranger course. To the above there should be added 27 students who are carrying forestry courses by correspondence, making 102 students in forestry for the year. The cosmopolitan character of the School is shown in the fact that these 102 students come from 24 different states and India.

The coming to us of Mr. P. D. Sharma and Mr. D. S. Man all the way from India to complete their training in forestry is especially gratifying. Mr. Sharma is a graduate from the Imperial Forest College at Dehra Dun,

India, and is a candidate for the degree of Master of Science in Forestry. Mr. Man is registered as a freshman.

The correspondence from prospective students is the largest it has ever been, thus giving every promise of a still larger enrollment the coming year.

Change in the Ranger Course

Beginning the coming year, the Ranger Course which has been announced as a two year course of five months each, will be given as a one year course of eight months. Altho this is a slight reduction over the former course in point of time, the work has been so planned as to include all the essential subjects. The work will be given in three terms, and the second or winter term will be offered as a Special Twelve Weeks' Course, designed for those who cannot come for a longer time.

New Correspondence Course

The School has announced the past year correspondence courses in "Our Trees and How to Know Them", and "Forest Economics". The correspondence course in "Lumber and Its Uses", first announced four years ago, continues to enjoy a goodly registration. About 175 men have enrolled for the course to date.

Investigations

The School of Forestry has had several important investigative problems under way during the year, altho incident to the rapid growth of the School the teaching load on the forest faculty has been heavy. New impetus was given the research program when a year ago the Board of Education, on the recommendation of Commissioner Bryan and President Upham voted to put the members of the staff on a year long basis, with a view to allowing them their summers for forest investigations. This is a wise policy and is enabling the School to render the state a much greater service than would otherwise be possible. It is recognized, however, that the training of young men for the forestry profession is the chief function of the School and this fact is taken into account in all its plans.

The School, throughout the year, has been in cooperation with the U. S. Forest Service in a study of the public requirements for keeping the potential forest lands of Idaho in a state of continuous forest production. This is part of a nation wide study inaugurated a year ago by the U. S. Forester, Col. W. B. Greeley.

As mapped out by the Forest Service, the study in Idaho involves two districts—the white pine region of the north and the yellow pine region in the south. The study of the white pine belt was made by Mr. W. C.

Class in Log Scaling in the Field

Lowdermilk of the Forest Service and Dean Miller, both spending the entire summer in a field investigation extending from the Clearwater country to the Canadian border. In the course of the fall and winter, a number of conferences were held with the timber operators and an agreement reached on the measures essential to continuous forest growth, tho entirely without reference to their practicability.

The study of the yellow pine region was made by Prof. C. Edward Behre in cooperation with Mr. R. H. Weidman of the Forest Service and their report now in preparation is likewise based on exhaustive field investigation and numerous consultations with operators and their representatives.

Research problems under way or completed the past year by Dr. Henry Schmitz, in charge of forest products laboratory are as follows:

1. Studies in wood decay III. The Availability of Western Yellow Pine Crude Oil as a Wood Preservative. To appear in the near future in the Journal of Industrial and Engineering Chemistry.

2. Studies in wood decay IV. The Tosicity of Pyridine and Quinoline to Wood Destroying Fungi with Special Reference to the Availability of Shale Oils as a Wood Preservative. Preliminary experiments completed.

3. Studies in Wood Decay V. The Effects of Sodium Chloride, Sodium Sulphate and Sodium Nitrate on the Rate of Decay of Wood Induced by Wood Destroying Fungi with Special Reference to the Rate of Decay of Wood in "alkali" soils. Almost ready for publication.

4. Note concerning the decay of western yellow pine slash induced by Polyporus volvatus Peck. Ready for publication.

Under the direction of Dr. Schmitz, Mr. P. D. Sharma has prepared and submitted for publication an interesting paper, on "The Maule Reaction as a means of Distinguishing Between the Wood of Angiosperms and Gymnosperms." Mr. Sharma also has in preparation a paper on "Studies in Wood Decay VI, The Relative Durability of Slash and Vertical Grain Lumber."

The stem form studies of western yellow pine originated, under the direction of Prof. C. E. Behre, by J. P. Drissen last year have been continued this year by J. W. Farrell and expanded to cover western white pine by J. P. Drissen. The work done last year showed that the second growth yellow pine in this region conforms very closely in stem form to the theoretical form indicated by Jonson's form quotient and taper series as used in Sweden. Farrell's work this year has been along two lines. The first aimed to determine the range of form classes represented in a given stand and the feasibility of using the form class of average trees as the average form class for a stand. The second studied the relation between actual form class measured outside bark and "normal" form class inside bark when graphical correction of the actual taper has been made to eliminate stump flare. Compilation has not yet been completed so that no conclusions can be drawn at this time. J. P. Drissen, who spent several months during the year doing graduate work at the school has worked over a large number of Idaho white pine analysis sheets and put them in shape for comparing their percentic taper with Jonson's theoretical taper series.

In addition to these studies in stem form, another project which may utilize the results of the first has been initiated by Ivan Melick under the direction of Professor Behre. Preliminary work has been done on the compilation of a yield table for second growth yellow-pine and several sample areas have already been measured.

W. Byron Miller, under Mr. Watson's directions, has completed a meritorious paper on range reconnaissance methods, based on personal observations and field work covering two seasons.

Summer Work

Nearly all of the student body and all of the faculty will again be employed in the field the coming summer months. The majority of the students have accepted jobs with the U. S. Forest Service and will be scattered throughout the states of the northwest; several will take work in the saw mills and logging camps, and a few will remain at the University for the summer session.

Of the faculty, Dr. Schmitz will have charge of a white pine blister rust survey with a party of six men under him. Mr. Watson will be associated with the U. S. Forest Service in grazing reconnaissance studies in Montana, while Prof. Behre and Dean Miller will be engaged in field studies within the state.

Associated Foresters, University of Idaho, 1922

THE ASSOCIATED FORESTERS

With new officers installed at the commencement of school last fall, the Associated Foresters of the University of Idaho completed another successful year in their history. The club officers for the year were: President, Herman Baumann, '23, Milwaukee, Wisconsin; Vice-President, Jack Rodner, '23, Moscow; and Secretary-Treasurer, G. W. Madlinger, '24 Poughkeepsie, New York.

The meetings were held in the evenings of the first and third Wednesdays of the month. This plan of holding evening meetings was very successful and enabled the club to combine pleasure with business. At the close of each meeting, it was customery to have the regular lunch, consisting generally of "hot dog" sandwiches, coffee and doughnuts.

The annual dance and banquet were the main functions of the year. These are described in some detail elsewhere. Then, at the time the proposed transfer of the U. S. Forest Service to the Department of Interior was much debated in Forestry circles, the Club met and as a body of coming Foresters, passed a resolution condemning this change. Copies of this resolution were forwarded to each of the Senators and Representatives of the State at Washington, D. C. Today, the Forest Service is where it rightly belongs, and may our hopes be that it remains there forever.

Later in the year, a five-real moving picture film, picturing the destructiveness of the white pine blister rust disease, was secured from the Department of Agriculture and shown at a special meeting which was opened to the entire university.

Work, cooperation and attendance are the essence of any organization, and these alone made it possible for the Club to enjoy a successful year.

The following calendar of the club's meetings gives the speakers and the subjects of their addresses:

October 26. Dean Miller gave a short talk to the club and urged a better scholarship over the good record made last year. Prof. Schmitz gave a welcome address to the freshman class and new members. Mr. Watson spoke on the true significance of the Forest Club.

Nov. 2. Dean Miller addressed the club on "The Twelfth Session of the Pacific Coast Logging Congress at San Francisco".

Nov. 16. Mr. W. C. Lowdermilk, Forest Examiner of Missoula, Montana, addressed the club on "European Forestry Methods".

Nov. 30. J. W. Farrell, '22, spoke on Xi Sigma Pi, the national honorary forester's fraternity, its ori in and merits.

Jan. 16-21. District Forest Inspector G. B. Mains of Emmett, Idaho, gave a series of lectures on "Management of Yellow Pine".

Jan. 23-28. Forest Examiner J. A. Larsen of Missoula, Montana, gave a series of lectures on "Silviculture".

February 13-18. Forest Examiner W. C. Lowdermilk of Missoula, Montana, gave a series of lectures on "Management of Western White Pine".

Feb. 27-March 4. Forest Examiner H. R. Flint of Missoula, Montana, gave a series of lectures on "Protection of Forests from Fire".

Feb. 23. Russel Cunningham, a graduate of the School of Forestry and now with the Forest Service, spoke on "The Week's Law".

A BIT O' THOT

I'm wond'ring tonight as I sit all alone
At a seemingly endless, hard task
If the petty awards of money and fame
Are worth the huge prices they ask.

I'm wond'ring if God, who sees all these things
Really planned for us mortals this strife,
Or if it's a crime to waste our short time
In molding a cold, worldly life.

When I see the old sun slowly sinking
In the mountain tops gay bedecked fold,
I know why God, the Creator,
Didn't make it to be bought and sold.

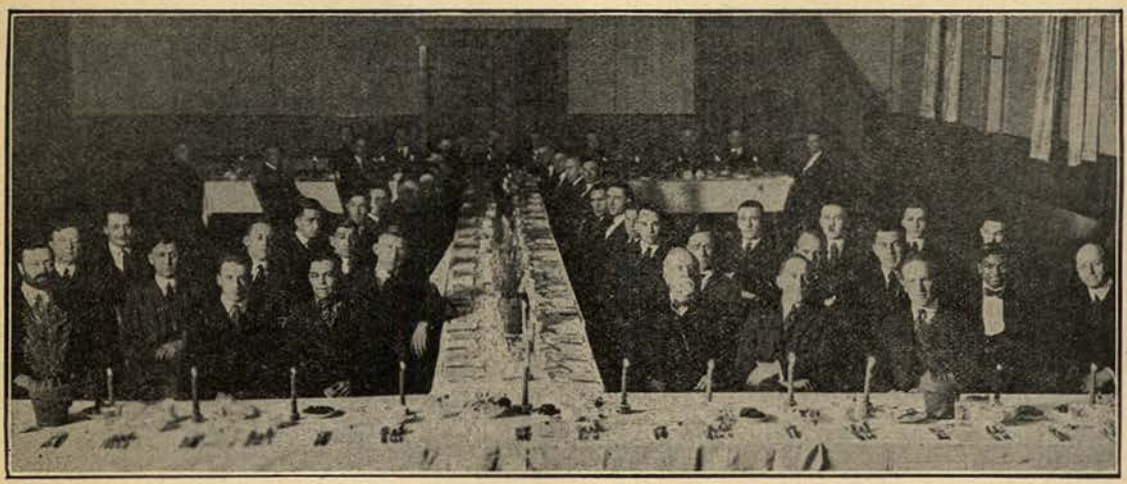
Why He didn't place a price on true love,
Or auction good friends on the block
Or fashion the earth in silver and gold
Instead of dust, mud and rock.

The sea could have been of sweet nectar.
The clean air of incense might be
And he didn't plant a column of marble
In place of a ragged, green tree.

So, why should this mortal-made money
Bring burdens that we cannot lift
And cause us to struggle and sorrow
When God-given things are just gifts?

Stanley Bartlett.

IDAHO FORESTERS BANQUET



The sixth annual banquet of the Associated Foresters of the University of Idaho, held January 19, was in every respect a pleasing event, reflecting credit upon Dean F. G. Miller and the committee on arrangements. The tables were set in the form of an "I" and were decorated with miniature evergreen trees, while the ball was lighted with green candles, one for each plate, set in pieces of wood representing sections from saw logs. Music during the evening was generously furnished by the "Jazz Four" from the university. The guests, Dean Miller and the toastmaster occupied seats at one end of the group of tables. Prof. C. W. Watson made a most efficient toastmaster, appropriate and in some cases most amusing comment accompanying his introduction of each speaker.

Dean J. G. Eldridge, head of the department of modern languages of the university, was the first speaker. He gave a clever impersonation of the poet, Vachel Lindsay, much to the amusement of his hearers, and then told some interesting history of the department of forestry, which was established at the University in 1909.

Ex-governor W. J. McConnell, who is perhaps more closely identified with the early history of Idaho than any other man now living, spoke on "Pioneer Days in Idaho." Despite his 82 years, he is a ready talker, and his tales of the early history of the state and of Moscow, always interesting, were especially so to the young men, many of whom are from other states and know little of the early days of Idaho.

Herman Baumann, president of the Associated Foresters, spoke on "Our Forest Club", telling entertainingly of the purposes and work of the club, and Paul Bieler, a member of the Ranger Course, delighted the audience with a solo on the ocherina.

Brown M. Schick, editor of the Moscow "Star Mirror", spoke on "Publicity as a Factor in the Promotion of Forestry", urging that the advantages of the excellent School of Forestry of the University of Idaho be carried to the world through the press.

P. D. Sharma, a native of India, who came many thousands of miles to take advanced work in forestry at the university of Idaho, interested his audience with his story of the life and work of "A Forest Ranger in India." Those present were given a vivid description of the work of the ranger in that distant land.

Ben E. Bush, assistant state land commissioner, told of the "State Forest Policy", referring to the various interests concerned and stating that the state of Idaho was enforcing the piling and burning of all brush left after logging on sales of state timber.

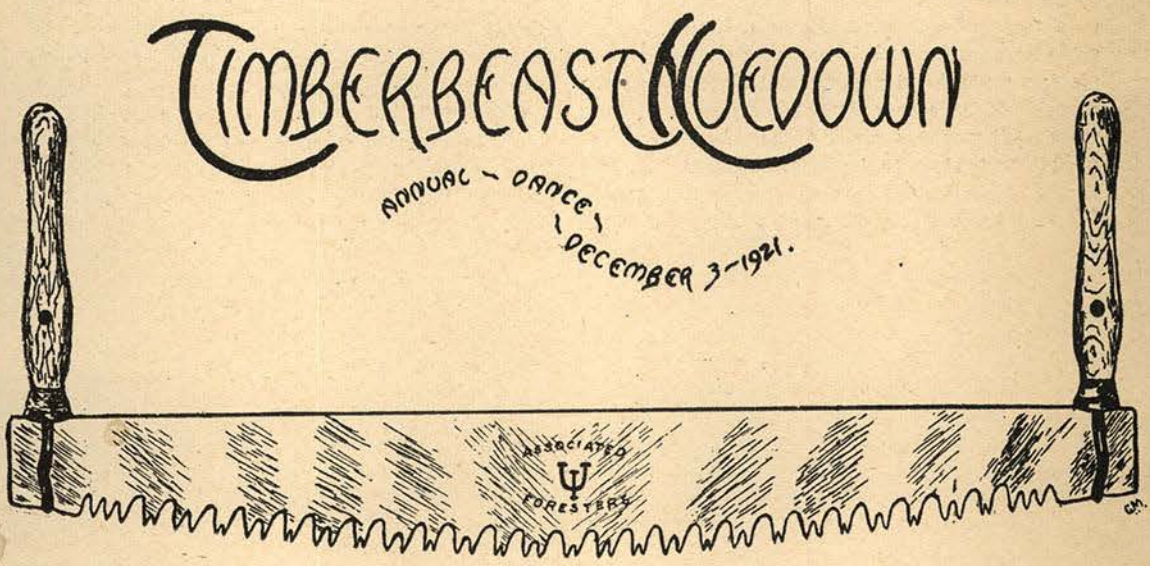
S. F. Bartlett, a young student in the forestry department, captured his audience with an original poem and responded to two encores with other poems of his own writing.

Representative Lloyd A. Fenn, of Kooskia,

a graduate from the forestry department in 1911 and now engaged in the practice of law and the operation of a newspaper, spoke on the "Proposed Transfer of the U. S. Forest Service to the Department of the Interior", pointing out in a most convincing manner the danger of such a move and giving much interesting data on the establishment of the Forest Service and the work which has been accomplished for the conservation of the nations' forest resources.

C. R. Patrie, an alumnus of the State Forest School, interested those present with a description of the proposed "President's Forest in Arizona".

The evening's program was brought to a close with a talk by G. B. Mains of Emmett, District Forest Inspector of the Payette National Forest on "Forest Reminiscences". His talk was replete with interesting happenings and many men well known in Idaho's history were mentioned.



The sixth annual dance of the Associated Foresters, known on the campus as the "Timberbeast Hoedown", took place in the University gymnasium, on December 3. Through long association with the elite of the campus, ye Timberbeast has acquired a stately taste for the latest in fashions. Hence, no "Timberbeast" was marked in the throng of dancers, due only to the absence of the conspicuous and conventional "Timberbeast" garb. Nevertheless, the "Timberbeast" aggregation was well represented, as was signified by the unique paper caps worn during the Foresters' special dance.

Long before the dance, a raid was made on Moscow mountains and several loads of evergreen saplings were brought home, which helped to transform the cold and bare walls of the gym into a miniature forest. The art of camouflaging the gym was in itself unique. In the center of the floor, a small grove of fir trees hid the orchestra. From above the grove. long evergreen streamers radiated in all directions to the balcony above and from there dropped to the floor again. The entrance to the hall was decorated, but above all, the lighting effect was wonderful—ask those who attended, especially the fair "Co-eds".

The programs were unique in themselves and made a handsome everlasting memory of one of the best dances of the year. A crosscut saw was selected for the cover design, and for four hours the orchestra "sawed" out some wonderful syncopated jazz music. The dance was a complete success from every standpoint, as was evidenced by the good spirit which prevailed everywhere.

PROTECTION OF THE FORESTS FROM FIRE

By JACK RODNER, '23

One of the most vital needs in Forestry today is a strong, uniform protective policy. Fire protection to the average person means little or nothing and withall this in itself is quite natural. Even in the most disastrous years with the timber losses mounting into staggering figures, the most powerful weapon of all, public opinion, still lies dormant. Large sums have been expended annually in an effort to educate people along those lines but to date these efforts have produced little in tangible results. Cancellaion stamps on envelopes, glaring multi-hued posters and Forest Protection Week have served their purpose well but there still remains much to be done. There is no attempt here to be critical about the attitude of the public only insofar as it has not thoroughly understood the gravity of the situation.

A few pertinent facts in the form of statistics will show these statements to be absolutely true. For convenience, we may separate the losses into those sustained by the National Forests and those sustained by private timber owners. From the most accurate data available, we find the average annual losses throughout the United States during a period of five years (1916-20) to be as follows:

No. of fires reported 32,517
Area burned over .....7,560,000 acres
Property loss $17,240,000

If we stop to consider that this is probably a fair average for any corresponding five year period, the total is sufficiently large to startle even the layman. Another interesting group of statistics is found in the losses sustained in our National Forests during a four year period.

Year	1917	1918	1919	1920
Total No. of Fires	7,814	5,573	6,800	6,078
Area Burned, Acres	962,543	694,651	2,007,034	342,193
Tot. Cost, Fire Fighting	$1,121,451	$714,009	$3,039,615	$1,000,000
Estimated Damage	$1,353,627	$688,332	$4,919,769	$419,897

The foregoing figures have placed before us a conservative idea of the fire losses both in the nation at large and in our national forests. In order that we may gain a more comprehensive idea of the situation, let us take for example a state such as Oregon. The following figures are taken from the report of the Oregon State board of Forestry for the years between 1911 and 1916. The average annual losses amounted to $119,245, while the acreage burned over was 16,250. It is only fair to state however that for a preceding period during which there were no protective measures, the fire losses were far in excess of those of the present time. During a three year period (1908-1910) in which there was no fire protective system, Oregon suffered an average annual fire loss of $663,935. A comparison between these figures certainly justifies the existence of the present system even though it is far from perfect.

A question that arises, or at least that should arise, in connection with any public expenditure is whether such an expenditure is justifiable. In the case of protection expenditures, the answer is yes. In support of such a positive statement, we have a myriad of hard cold facts basd on sound economic principles. What damage does a forest fire really do? How sweeping and far reaching are its effects? The answers to these questions may be classified under eight main heads:

1. Injury to trees containing merchantable material.
2. Injury to young growth including reproduction.
3. Injury to the soil (Physical rather than chemical in nature).
4. Injury to the productive power of the forest.
5. Injury to the forage.
6. Injury to the stream flow and industry.
7. Injury to property.
8. Injury to human life.

It is impossible here to explain fully each of the points mentioned, but a few words will sufficiently emphasize their importance. Injury sustained by merchantable timber in a fire is plainly evident. Such an investment or possession has a cash equivalent and its destruction therefore means the same in dollars and cents, as any financial loss. Injury to young growth, on the other hand does not represent an investment upon which there is an

immediate return. Such an investment will have a cash valuation only when the young growth reaches merchantable size. The destruction of reproduction places the non-agricultural lands on a nonproductive basis and makes them a liability rather than an asset. Vast and practically denuded areas bear mute testimony as to the destructiveness of repeated and intense ground fires. Weathering and erosion follow closely upon the destruction of the soil cover. Ordinarily in a few short years after a destructive fire an area becomes permanent waste land with only slight possibility of further production.

The value of our forage crops in relation to the live stock industry can hardly be overestimated. A brief synopsis from the report of the U. S. Forester will serve to illustrate the value of the forest as range land. In the year 1921, which is a good average, there were issued on the National Forest alone 31,560 permits for cattle and horses and 6,500 for sheep and goats. More than 2,000,000 cattle, 79,000 horses, 3,000 swine, 7,400,000 sheep and 43,000 goats were grazed on the forests that year.

The relation of the forest to industry and stream flow is a subject which, up to a short time ago, had received little or no consideration. A timely or possibly one should say a tardy effort is now being made to prevent the destruction of timber on the important watersheds and to protect the heads of navigable streams. The industries that depend upon water power must have a constant and uniform stream flow. In order to obtain this, there must be sufficient ground cover to prevent rapid run off. A properly managed and well protected forest upon the head waters of such streams is the solution, rather than merely a solution of the problem because forests more than any other type of cover hold back flood waters, and preserve the uniformity of stream flow throughout the year. Dredging operations on many of our well known rivers, to a great extent might have been avoided if the proper attention had been paid to safeguarding the soil from erosion.

Last but not least is the tremendous property loss which accompanies each of the bad fire years and to this might be added the none too insignificant loss of human life. There are many points that might be considered under the head of direct and indirect results of fire; here we have only attempted to enumerate the main points.

It is hard, if not impossible, to make a direct statement as to the efficiency of the present protective system. It is undoubtedly true that the Forest Service officials are handicapped by lack of funds, but despite this, splendid work has been done along the lines of forest protection . Along parallel lines, we find the private timber owners, who, practically without exception have shown a readiness to cooperate with the Federal and State governments in protecting our standing timber.

A question which is by no means settled is the question of who shall carry on the work of protection. The entire question hinges directly upon what agency is best fitted to carry on this work. Some people say the U. S. Forest Service, some the various states, and some advocate the present system of division of responsibility between federal and state governments and private owners. Whatever the answer is, it should have immedate consideration and a rapid solution. One thing is certain, there should be a universal fire law adaptable to the needs of local conditions.

It is certain that in any protection program the nation must take part of the responsibility, but the timbered states are much more vitally affected than the non-timbered states. Therefore, their burden of the cost should be proportionately heavier. There is one outstanding advantage in state control, and that is the fact that it would bring home to the people living within the borders of the states in question a greater feeling of responsibility regarding our forests.

Any sound protective policy should be based first upon sound laws capable of being enforced and second upon provisions for adequately enforcing such laws. Such a statement sounds simple and it is, so simple in fact that it has proven itself to be one of the most serious stumbling blocks in protective work, whether private or national. To say just what is lacking, or what means should be taken to make a practicable working system is extremely difcult, but without reservations it can be said that if such a system could be determined and inaugurated it would solve a multitude of perplexing problems.

LEAVES FROM THE DIARY OF AN AMERICAN FORESTER IN CENTRAL SWEDEN

By C. W. WATSON
Instructor in Forestry

February 5, 1921.

How good it seems to be at the journey's end once more! It will not be for long. I shall soon be on the move again and the next trip will take me close to the Arctic circle, the country of deep snows and low temperatures, but here comes the maid with some coffee, so good-bye thoughts of the cold!

I left the forest at Alkwettern this morning to come here to Fredriksberg. The total distance is only one hundred and fifty miles but it took over twelve hours to travel it. I had to ride thirty miles through the woods in a sleigh to the railroad and it was a beautiful trip. The snow was about three feet deep and the temperature so low that the cold pierced even the wolf skin coat. The driver was an old soldier with a keen glass eye in place of one which he had lost in an old engagement. He was disposed to be talkative but occasional fits of silence gave ample time to look about at the country. For a while we would pass through sombre stands of pine and spruce, some of which were bent low by the snow, and then we might leave the road to glide out upon the ice of a serpentine lake. The ice on these lakes freezes so thick that they are used to haul logs on until the last of April. We followed the lakes for miles, crossing a little isthmus now and then to go from one to the other. Occasionally we met a sled with a load of saw logs, driving to some convenient place to dump them. Here and there along the shores could be seen large areas where the logs had been brought from the woods and laid on the ice to await the moment when the ice would go out with the spring thaw. Then booms would be thrown about them and floated to the mill.

We traveled thus from five o'clock in the morning and eleven o'clock saw us at the railroad station. The train soon came and a few minutes later the driver and his sleigh were dissappearing around a bend in the road. This line is standard gauge and quite comfortable but at one o'clock I changed to a miserable little narrow gauge road, operated by the company which owns this forest about Fredriksberg. The miniature train was due at this village about five p. m. It was a dreary prospect of four hours to be patiently endured.

Nine people occupied the compartment and it was warm and comfortable. Most of these travelers were woodsmen, husky fellows, young and lively. One played melancholy folk songs on an asthmatic accordion. Through a half-opened window I caught fitful glimpses of deep snow drifts and silent woods but the sun set early and sudden darknes enveloped us. Occasional bursts of music, sandwiched between periods of conversation, made the trip more interesting than I had anticipated and at last, about five o'clock in the evening, the little train wheezed into Fredriksberg. My belongings and myself were soon located at the village inn, there being no hotel, and now the coffee is finished and I am wondering what experiences may await me here.

February, 6th.

Fredriksberg lies in the high country to the west of central Sweden, in the most picturesque and famous province of Dalacarlia where a network of streams thread the forests and bear their burden of logs to the mill in the spring. Around the end of one of these lakes—an aimlessly winding sheet of water—has the village grown up. A typical example of a woods community, it has a village store, an inn and many small, one family houses. All of this is owned by the Hallefors Company which operates a paper mill here—the only local consumption of forest products. As spectators in an amphitheater, the brightly colored homes sit on the tree-clad slopes and look down upon the lake. They witness the drama of life in this little village played slowly and simply with the shifting seasons for scenes. How fortunate to have arrived in time to witness a real incident of this drama! Today one of the events of the year was enacted—the annual cross country skee race.

About ten o'clock the racers were gathered on the lake just before the inn. This point had been chosen as the starting place and final goal. The race was to be run in three relays with six men to each stretch. The three courses lay

between the start and two control points. All of the route was through forested and mountainous country with but little opportunity to use roads. The total distance was thirty miles, about evenly divided between the three relay distances. On the preceeding day the contestants had formed the three-man teams and each man was assigned a station to start from; either the starting point or one of the control points. Each racer then received a topographic map of the region with the starting point and the control points indicated thereon. He was supposed to select his own route and guide himself to his destination by aid of a compass. It was a trial demanding speed, endurance and skill in woods travel, as well as the training peculiar to skee running.

As the hour of ten approached, the contestents prepared to leave the start. All were young men; slender, wiry fellows. They wore very light clothing. Their shoes were made of woven wood fiber and were turned up at the toes to prevent them from slipping out from under the toe strap on the skee. The skees were birch runners about eight and one-half feet long and two and one-half inches wide. In each hand was held a light pole five feet long and shod with steel at the lower end. The equipment was completed by maps, map cases and compasses.

The moment for the start came. The men lined up and with the pistol shot they were on their way, pushing themselves across the ice by short, rapid jabs of the poles. On the smooth ice they made great speed. It was immediately evident that all had not chosen the same course because only two stuck together, these following the lake while the others broke for the woods and were quickly lost to view in the timber.

Now that the runners had left, there was little to do but wait four of five hours until the third relay came back to the start to finish the race. We had dinner and walked some in the village, returning to the lake about two o'clock. None of the men had come in. They could hardly be expected to have covered thirty miles in that rough country before half past four. The weather was perfect, as it had been all during the morning. It was cool and the air was quite still. A cloudy sky prevented the customary glare of sun on snow which lay three feet deep on the land, although it had been blown off from the ice of the lake.

At twenty minutes after two a dark object could be seen coming through the trees on the far side of the lake. For some moments we were uncertain as to the man's identity but his speed and light clothing stamped him unquestionably as one of the contestants. He seemed almost to be falling down the slope, so great was his speed and then he shot out upon the ice. As his speed lessened, he used his poles and glided swiftly to the goal where a mob of friends grabbed the winner and gave him a congratulatory toss or two. He was Gustavsson, one of Sweden's best runners. In this final stretch he had covered twelve miles in about an hour and one half.

Within an hour the other five men came in and they were received in like manner. Of these the second was a man of almost sixty years—Gustavsson's father, a tough old hunter and ranger who is a well known character in that region. Thus ended the contest but the celebration had just commenced. A silver trophy cup was presented to the winner and then the Company extended a cordial invitation to all to come to dinner. It was hardly a dinner but rather a banquet. All of the familiar foods seemed to be there and also many strange new ones. The spirits flowed in abundance and gaiety reigned. Later the rooms were cleared and a dance started to the music of an accordion. There were some evidences of the waltz and the foxtrot but no jazz and the native dances were by all means the more popular. To judge by the footwork and the noise thereof, they might well have been called "breakdowns." At any rate it was a fitting climax for an unusual and most interesting day.

February 7th.

To-day the wonderful weather continues. The Forest Chief, Mr. Nordberg, called up before breakfast and arranged to spend the day in the woods. At nine o'clock he came in a two horse sleigh, filled with fur robes and we rode off, comfortably buried in these. The lumber company owns all of this country for miles about, so it made little difference in which direction we traveled. To examine the waterways, we followed a chain of lakes which pierce the heart of a large tract of about 450,000 acres. In this area there are but few private land holdings and these are small farms.

The timber is all Norway spruce and Scotch pine. The management is fairly intensive, a few thinnings being made before the final operation which is a clear cutting. The stands are heavy at the lower elevations but on the

mountains, and on many high, flat areas, are barrens and stunted tree growths. The climate is really very severe. On the cuttings, pine seed trees are usually left, if available, but never is spruce used for seed trees. It is too subject to windfall. Considerable planting has been done, because a period of fifteen or twenty years is required to regenerate the area naturally. At present, seeding in spots, three years after the cutting, is the usual practice. Peat bogs are plentiful—they cover thirty per cent of the area—and here considerable ditching has been done to dry the soil and relieve it of its acid constituents. In one such place, the leaders of the spruce had begun to grow twice as fast, about three years after the ditching had been done.

The timber is practically all floated to the mill. Some of it from the distant districts travels sixty miles in the water. There is a chain of six lakes, at least three of which are provided with good dams. Some of the streams through which the logs pass are only about ten feet wide but there is a considerable volume of water in them when the spring thaw comes, early in May, and all of the stream courses have been improved. Boulders have been removed and levees have been constructed at the bends and at other places where there might be danger of the logs stranding. Through the winter the logs are skidded to the lakes and laid on the ice in sections, one log deep. Just before the ice goes out, booms are laid around the logs and they are pulled down the lakes by boats. Then they are sent through the streams and lower lakes. The dams may be constructed of either earth or timber crib work, the latter being usually rock ballasted.

Scattered throughout the woods, even in the most remote districts, are small farms. These are leased to desirable occupants. The farms fall under three heads: (1) wood choppers' homes without horses; (2) farms with one horse each; (3) farms with two horses each. The number and kind of stock, as well as the area of ground to be cultivated, is definitely fixed for each farm. Let us suppose that a poor man moves into this region and he wishes to stay. If a desirable character, he may make a two year contract with the Company to let him have a farm and credit at the Company store. In return for these favors, he agrees to work in the woods at least two hundred days during the year. The workers are paid according to a definite scale which has many interesting features. Allowance is made for extra pay if work is carried on under exceptional difficulties. Fifty per cent extra is allowed for overtime on week days and one hundred per cent for overtime on Sundays. Financial aid is given to a family for each child over two, i. e. the third, fourth, fifth, etc.

The whole system is a remarkably efficient one. The forest workers live at home in a contented manner and their work usually lies in the vicinity of the home. The farms are well scattered to make every part of the forest quickly accessible. The contract system stabilizes labor conditions; there is little shifting of labor which is so important a cause of inefficiency. Nordberg introduced me to several of these families and, on inspection of their homes, I found no luxuries but the essentials of life were obviously present. The houses are comfortable and practical to withstand the severe winters.

Our whole trip to-day covered about twenty-five miles. It was so replete with interest that I was glad to return to the inn and note the important points before I forgot them.

A PRELIMINARY REPORT OF SUCCESSION ON DENUDED AREAS

By FLOYD W. GAIL

Associate Professor of Botany

So far as the writer is aware, no work on succession on denuded areas has been done in the Palouse country. The following is merely a preliminary report of a study begun in the spring of 1916, some six years ago. Five denuded meter quadrats were made on the southwest exposure of Tomer's Butte. This butte is in Latah County, Idaho, about four miles distant from Moscow.

Some of the annuals of this slope in the spring are: Ranunculus glaberrimus, Claytonia lanceolata, Dodecatheon vulgare, Col-

linsia tenella, Tellima tenella, Clarkia pulchella and Festuca pacifica. Some of the perennials are a few scattered bunches of Agropyron spicatum, Balsamorhiza sagittata and Achillea millefolium. The majority of these plants are matured by the time the drought of summer is well begun.

The plants of the quadrats were charted in June and September of each season except the summer of 1919. The moss stage of succession has not yet appeared. No plants started during the first season. In June of the second season, nine annuals were found. The scientific names and the number of each species were:

Amaranthus blitoides	3
Collinsia tenella	5
Myosotis sp.	1

In September a dried dwarfed specimen of Amaranthus blitoides was still standing which had produced some seed. At this time, no other genera had survived the drought of the summer months.

The plants of a representative quadrat were charted in June of 1921. The results given below showed a considerable number of new invaders. The following genera with the number of each species were found:

Clarkia pulchella	5
Myosotis sp.	5
Collinsia tenella	21
Cogswellia sp.	2
Tellima tenella	3
Achillea millefolium	1
Poa ?	1

The Achillea millefolium was near the edge of the quadrat and probably came from a root of a plant adjacent to the quadrat. The results show that in five years five genera and a total of 36 species have invaded the quadrat if Achillea millefolium is regarded as having its origin from roots outside the quadrat. These are practically all annuals and mature before the drought of the summer is far advanced (Weaver, 2). The grass which resembles a Poa, but which did not fruit and the two Cogswellia are the only perennials that survived. No Amaranthus was found in September of this season.

The slowness with which succession is taking place may be better undertsood if we consider some of the physical factors.

There is in this region about 21 inches of moisture that falls annually. Only about one fourth of this moisture falls during the growing season. During the months from July to September or even to October, there is usually very little precipitation. The precipitation during these months is usually so little that it is not available for plant use.

The average weekly evaporation for 13 weeks of the growing season of 1916 was 172 ce. of water. The average daily evaporation for the same period was nearly 25.8 cc.

The evaporation for the last three weeks of August was not below 285 cc per week or an average daily evaporation of 40.7 for the three weeks. The prevailing southwest winds are responsible to a great extent for this high rate of evaporation. The high temperatures of the atmosphere and soil are also important factors. The soil necessarily becomes very dry. The average wilting coefficient of the soil on this slope is 11.21. During the summer of 1916, which, was an average summer, Gail (1) found the moisture in the soil was below that of the wilting coefficient for a period of nearly seven weeks. These facts explain why succession is so slow and why the majority of the plants on the southwest slopes are largely early maturing plants. The few perennials are deep rooted and a considerable number of them are in a resting stage during a large part of the summer months. The only conclusions that can be derived are that succession on the southwest slopes in the Palouse country is very slow. This is undoubtedly due to the extreme xerophytic conditions which prevail during the growing season. This investigation is still in progress and reports will be made from time to time as points of interest in regard to succession arise.

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PRELIMINARY NOTE CONCERNING THE CAUSE OR CAUSES OF THE DURABILITY OF WESTERN RED CEDAR, THUYA PLICATA

By HENRY SCHMITZ

Associate Professor of Forest Products

The resistance to decay of the wood of western red cedar is a well known fact, but as far as the writer is able to ascertain from the available literature the cause or causes for this resistance, although usually attributed to the presence of a toxic resinous substance, are still partly unknown. It may also be due to any other toxic substance which may occur in the wood or to some mechanical effect produced by the cell walls themselves. Then, too, recognizing the almost infinite number of possible isomers of such a complex molecule as cellulose, durability of certain woods may be due to the structure of the cellulose molecule itself, a somewhat similar phenomenon is shown by the more simple sugars with reference to their great variation in fermentability.

The present note reports the results of some preliminary experiments dealing with the extraction of the toxic principle from the wood of red cedar.

Samples of ten grams each of finely ground red cedar sawdust (which had been sifted through a sieve having a one millimeter mesh) were treated in a Soxhlet's extraction apparatus for six hours with the following solvents: water, ethyl alcohol, petroleum ether, acetone, chloroform, benzol and ether. After the extraction was completed, the volume of the extracts was reduced to 100 cc., making each 10 cc. of extract the equivalent of one gram of sawdust.

Ten cc. of the various extracts were then added to one gram samples of lowland white fir (**Abies Grandis**) sawdust in glass test tubes and the solvent evaporated at 35 deg. C. Distilled water was added to the sawdust and then the tubes and contents were sterilized at ten pounds pressure for fifteen minutes. A control series of white fir sawdust to which the various pure solvents had been added and evaporated was also set up in addition to the regular red cedar and white fir controls.

One gram samples of the extracted red cedar sawdust were also placed in test tubes and distilled water added and sterilization affected as before. All of the culture tubes were then inoculated with **Lenzites saepiaria**.

After one and two weeks, the tubes were carefully examined with a hand lens in order to determine in which tubes and to what extent growth had taken place. The results are shown in Table I.

TABLE I. EFFECT OF TREATING RED CEDAR SAWDUST WITH VARIOUS SOLVENTS, AND OF ADDING THE EXTRACT TO AN EQUAL AMOUNT OF WHITE FIR SAWDUST

Solvent	Red Cedar after extracting	White Fir with red cedar extract (Solvent evaporated)	White fir with pure solvent (Solvent evaporated)
Water	Fair growth	Good growth throughout entire sawdust	Good growth throughout entire sawdust
Alcohol	Good growth throughout entire sawdust	No growth	Good growth throughout entire sawdust
Petroleum Ether	No growth	No growth	Good growth throughout entire sawdust
Acetone	Good growth throughout entire sawdust	No growth	Good growth throughout entire sawdust
Chloroform	Very limited growth from inoculum	No growth	Good growth throughout entire sawdust
Benzol	No growth	Limited Growth	Good growth throughout entire sawdust
Ether	No growth	No growth	Good growth throughout entire sawdust
Control	Red Cedar	No growth	
Control	White Fir	Good growth throughout entire sawdust	

The results are more or less self-explanatory, but a few pertinent points may admit of further discussion. First, after extracting red cedar sawdust for six hours with distilled water, not only is this sawdust susceptible to decay, but the aqueous extract when added to white fir sawdust will not inhibit its decay. This result may be explained in several ways. First, that the toxic substance was broken down or hydrolized during the extraction. Secondly, the amount of toxic substance may have been reduced sufficiently to allow fair growth of **Lenzites saepiaria** in red cedar sawdust when inoculated with the fungus, yet the extract did not contain a sufficient amount of the toxic principle to render white fir sawdust resistant to decay. Or, lastly, it may even be possible that in the six hours extraction the cell wall constituents became slightly modified, thus changing their resistance to decay.

Acetone and ethyl alcohol seem to extract the toxic principle most completely, leaving the red cedar sawdust very susceptible to decay, and the extract, when added to white fir sawdust, prevents the growth of **Lenzites saepiaria**.

Further experiments dealing with the cause or causes for the durability of western red cedar are now in progress in this laboratory.

A CAMP FIRE

I can see the silent evening sky,
O'er snow capped copper peaks,
And feel the shelt'ring hand of God,
In the wind that almost speaks.

The trees are rugged, straight and tall,
The night is big yet near,
God and I are there alone
In a silence I almost hear.

The roaring of the canyon falls
Comes splashing down the stream
And I'm wond'ring by my campfire
If I live or only dream.

There's a spell about the campfire
That holds me to the trail,
Altho I never reach success
I seem to never fail.

Battles are fought and struggles won
Among the campfire's brands,
Secrets are told and secrets got
When sympathy a soul demands.

And memories both sad and sweet
Blaze in the cinders gold
Youthful dreams and castle's fine
This melting pot of life enfolds.

Oh, many maids and many men
The spell of the embers bright
Have felt, and marvelled at its call
But heeded not its wondrous light.

Yes, I'm dreaming of old campfires
'Neath a cultivated tree
And I thank God for my mem'ries—
Those, no one can take from me.

Stanley Bartlett

FIVE NEEDLE PINE IN INDIA

By P. D. SHARMA, M. F., '22

Distribution

This five-needle pine is found in the Himalayas between 6,000 to 12,000 feet elevation. Its zone is much the same as that of Deodar (**Cedrus libani var. Deodara**), but it is usually most at home at about 7000 to 9000 feet.

Locality

This species grows on almost any soil, and is often found in very exposed situations and on rocky ground. Trees have been seen growing on practically bare rocks in the crevices.

Shape and development

This pine is a large tree capable of attaining 120 feet in height and 10 feet or more in girth at B. H. It has the habit of throwing out long horizontal side branches, which often persist even when dry, causing hard, resinous knots right thru the trunk to its core. It is a gregarious species and exceedingly light loving. It grows fast, the rate varying with the soil and climate. On an average, it takes about 120 years to attain 2 ft. D. B. H.

This pine has five needles in a cluster and cylindrical soft scaled cones. Flowers appear in spring and fruit ripens in the autumn of the following year.

Character of Forest

It is often found mixed with deodar, oaks and rhododendron. Having itself a very light crown, it thrives well in company with heavy foliaged trees, like the oaks, which enrich the soil. In presence of sufficient direct light, it tends to become invasive, and by its comparatively rapid growth to dominate over other species. It makes an excellent nurse tree to deodar, which is far more valuable.

Reproductive Power

Natural regeneration is easy in all areas protected from fire. It seeds every year, with especially good seed years at intervals. The male and female flowers are on separate branches. In blanks, on grassy lands and wherever available ground with full sunshine is found within reach of the parent tree the seed, which is light and winged and may be carried by the winds a long distance, on falling, germinates and patches of young pure pine are noticed.

Sowing and planting

Sowing is not difficult, but the seedling is difficult to prick out and transplant. Direct sowings have proved best. The planting, however, is done with balls of earth or in baskets.

Tending

Being a very light demanding species, it requires no tending. The crop thins out quickly after establishment. Of course, when young, protection from grazing is necessary, as well as from fire.

Method of Treatment

When pure, crops of blue pine are best treated by the uniform method. No preparatory and no secondary fellings are required and the old crop may be realized and the regeneration effected by two fellings, a seed and a final felling at an interval of 10 years. When grown in mixture, the selection method is most applicable. Six feet girth at B. H. is taken as exploitable size.

Utility

The timber is considered superior to that of three needle pine and is ranked second to deodar (which is considered as one of the best timber trees in the world). It lacks the durability which places deodar in the first rank, but it is superior to deodar in elasticity.

Wood is pinkish in color, compact, even grained and handsome, not very hard but easy to work. It has distinct annual rings and prominent resin ducts. The medullary rays are fine and give something like silver grain on radial section. Wood floats well, makes good railway ties, and is largely used for construction. It is also tapped for resin but yields less quantity than three needle pine. The wood is in great demand for fire wood or charcoal, for both of which purposes it is excellent, the dry wood containing only 0.35 per cent of ash.

This description will show that nature practically works in the same way throughout the world. Here in America we have the white pines with their needles in bunches of five, while on the Himalayas, 20,000 miles away from America, a pine of similar character grows.

PERSONALS

E. H. Myrick writes "I have been promoted to Forest Supervisor on the Lewis & Clark National Forest at Chateau, Montana, effective April 1."

Major Herbert A. Wadsworth, Infantry, U. S. A. '11, is stationed at Fort Howard, Md., where he is on duty with Headquarters, Third Corps Area, and assigned as Assistant for Operations in the General Staff Section. Prior to reporting at Fort Howard in November, Major Wadsworth was on duty in France for almost two years with the American Graves Registration Service.

Lloyd A. Fenn, '11, one of the first three graduates of the Idaho School of Forestry has been practicing law at Kooskia, Idaho since 1919. He was married to Miss Shirlie Shunk of Missoula, Montana in 1918. He spent 4 years with the U. S. Forest Service upon leaving school and then entered the Montana Law School hoping that as a lawyer his summers would be more peaceful than he found them as a forest ranger. Although no longer a forester himself, Mr. Fenn is one of the best friends of forestry in Idaho and as such still keeps in very close touch with the School and its activities. He was one of the principal speakers at the annual banquet of the Forest School last winter.

The following extract from a letter from A. D. Decker, '13, indicates that he has no trouble keeping busy as Land Agent for the Potlatch Lumber Company, Potlatch, Idaho. "My work in the winter consists largely in looking after the tax matters of the company, the land and timber records, and the work connected with land settlement and development. Our summers present a variety of work found in but few other lines. It varies thru the season from showing sheep herders onto allotted ranges, acting as scout, guide or interpreter for land tourists and home seekers, land appraisals and survey work to appearing before the state and county boards on tax matters. The company also has a considerable acreage of agricultural land which we farm. I am now among those married, having been married last fall to Miss Charlotte Laird of Potlatch."

C. E. Favre,'14, says: "I am now located at Elko, Nevada as Supervisor of the Humboldt National Forest. In addition to my work on the Humboldt, I have inspection work to do on two other Forests in central Nevada. Mrs. Favre and I remember, with pleasure, our recent trip to the University of Idaho, and we certainly wish the institution were closer in order that our visits might be more frequent."

Ralph H. Parsons, ex '14, writes as follows from Coeur d'Alene, Idaho: "Since leaving "Idaho", have been working with the Forest Service in Idaho and Montana. Was on Timber Survey work from 1912 to 1915 during the summer months. Appointed as Ranger in 1915 and worked on Land Classification for three years. Married in 1916. Moved to Coeur d'Alene Forest in 1918 and given a ranger district for three years. From now on will take over the planting work on the forest and also be assigned to timber sales work. The family consists of one extra—a girl four years old."

Howard C. Gildea, ex '14, is practicing law at McMinnville, Oregon, making a living, gaining experience and devoting all spare time to the American Legion. Specialty: speaking before Y. M. C. A. and Women's Clubs. Has managed to keep out of politics, almost, so far, and is still looking for the ideal girl.

Mark Anderson, ex '15, is manager and half owner of the Hotel Roberts, Provo, Utah, the largest hotel in Utah south of Salt Lake City. He left Forest Service August 1, 1919 and says he has one wife and two boys, one 3 years and one two months, both born on January 30.

Wm. R. Schofield, '16, writes: "My present location is Chinook, Montana, where I am engaged in Engineering business and hold the office of County Surveyor of Blaine County, Montana. Just recently I received a letter offering me an appointment as Deputy Supervisor on the Wyoming-Bridger Forest in Wyoming, which offer I am considering seriously and by the time the publication is out I may again be engaged in Government Forestry work. I am married to a University of California girl, formerly Miss Elizabeth McMillan, daughter of a Eureka, California, lumberman. We have a son, Richard McMillan

Schofield, five months old. My advice to those of you who are completing the work in Forestry is that you stick by forestry work and not chase the rainbow, thinking that other work pays more and that is what you want. The education of Forestry will be so firmly instilled in your life that you will not be satisfied in any other work but that concerned with the business of Forestry. To the technically trained forester, there is no greater service to mankind than that which may be rendered in the application of forestry training in the conservation and utilization of one of nature's most important resources."

D. H. Yates, '17, writes: "I am still with the Potlatch Lumber Company in the Land Department. In fact, it isn't very difficult to keep track of me. Also, I am still married though I haven't 'any other items of a personal nature' around the house—yet. I see Russ Cunningham, Tom Jackson and I. W. Cook occasionally as they stop between trains, and I manage to get over to the Forestry School frequently. I would like to see a reunion of the old gang some time, but presume we are pretty well scattered now for that."

Harry E. Malmsten, '17, is with the U. S.. Forest Service, Ogden, Utah. Occupation: range investigations, the object of which is to devise better methods for full utilization of the grazing resources in the United States, particularly in the National Forests of the Rocky Mountain Region. Harry is still single and probably will remain so as long as he roams the high mountains and the hot deserts. Altho he is called by some "a sage rat", he occasionally enjoys getting up at high elevations where the snow lies in drifts until August. He is rather fond of the high altitudes, especially during the months of July and August.

R. N. Cunningham, '17, has been assigned to Weeks Law Inspection for the U. S. Forest Service with headquarters at Missoula, Montana and writes: "Am just plugging along at the forestry business—no wife, no kids, no prospects of any—still poor and own no oil stock."

Herbert W. Johnston, "Red", ex '17, is with the U. S. Biological Survey, Unalakleet, Alaska. Occupation: Range Investigations. The object of which is to determine the amount of grazing resources in Alaska suitable for grazing reindeer. Proper methods of handling and managing reindeer herds are being worked out. "Red" is single and expects to stay single as long as he remains in Alaska. When it comes to "mushing", "Red" is "some musher" and surely knows how to handle the "huskies".

Clyde P. Humphrey, ex '17, writes: "Since leaving Idaho in winter of 1916-17 have spent nearly two years in U. S. Engineer Corps, sixteen months of it overseas; six months at Moscow with the local Highway District on location and construction of highways. Since October, 1919, have been employed by the Idaho State Bureau of Highways on location and construction of hard surfaced highways. By the time the Idaho Forester is in press will be located at Coeur d'Alene on construction of a hard surfaced project. For the benefit of the old 'timber beasts', I am no longer running at large, having but recently become a Benedict."

John Gilman, Ex '19, is at present caretaker of a Hunting Lodge and may be addressed at Obsidian, Idaho, via Stanley.

Paul J. Martin, Ex '19, forsook forestry for the insurance business and is now special agent of the Liverpool & London & Globe Insurance Company Limited for the Idaho and Eastern Washington district, with headquarters at Spokane, Wash. The following extract from a letter recently received from him indicates that his interest in forestry is still keen. "The department of Forestry of any school or college has unlimited possibilities to assist materially in the development of this great nation of ours. The subject of timber utilization and conservation is indeed most timely. I sincerely believe that the men of the Forest Service have one of the most patriotic callings of the present day. This great army of men is far sighted and broad visioned. Looking into the future, they see that unless the tactics and present methods are changed, it will not be long before our timber resources are exhausted due to extravagant waste. I am glad to see that so much intensive work is being done along lines of reforestation.

"Not only does the study of Forestry and work in the great forests of this country fit a man for a high and profitable vocation, but it at the same time makes men and builds character. If I had a dozen boys it would be my sincere desire that each should

spend at least a year in this great service, and I would encourage one or all to the calling as a life work. By environment and necessity a fellow is compelled to think for himself and act quickly. What greater asset could a man possess be he lawyer or doctor?"

George L. McMullin, Ex '18, writes: "I am acting as manager of the Specialty Department for A. Carlisle & Company, 251 Bush Street, San Francisco, California. This organization is one of Manufacturing Stationers, Printers and Lithographers and my end of the business consists in handling certain loose leaf and duplicating device specialties."

George M. Hammond, Ex '20, says: "I left school in the early spring of 1918 and enlisted in the Heavy Coast Artillery branch of the service from which I was discharged, after gaining much practical experience, in the latter part of November of the same year. I returned to Pocatello where I married Miss Elizabeth Bowerman, an L. & S. student at "Idaho", on December 10. After a short visit with my parents in Boise, I went into business with my father-in-law, Mr. Chas. C. Bowerman, who owned and operated three retail yards in and around Pocatello, on January 1, 1919. Due, I suppose to the knowledge I was able to absorb while taking the forestry course at Idaho, I have been able to hold down, with this concern, a minor job ever since.

"While I took the Engineering Forestry course at school, having in mind the fitting of myself for a cog in the wheel of the productive end of forestry, I find that the general knowledge has helped me greatly in the selling end of the game. To illustrate: I, having familiarized myself with the texture, et cetera, of the woods native to this northwestern part of the country and having a knowledge of where the various stands of wood are located, am able to place our orders where we will get the kinds of materials best suited for the demands of the trade. It is a small item in the line of service, but after all, service is a good foundation on which to build a future growing business. I could relate many ways in which I am able to apply the course to my every day work."

E. T. Nero, Ex '22, writes from Orofino, Idaho: "I am a forest ranger on the Clearwater National Forest and intend to get a furlough next fall so that I will be able to finish my college course next winter."

G. B. Chamberlin, Ex '22, writes from Coeur d'Alene, Idaho: "Since leaving school, I have worked a year in the Rutledge saw mill, learning the manufacturing end of the lumber business. Later, I was transferred to the shipping end and lastly to the Retail department in which I learned the grading and selling of lumber. The lumber business was not flourishing that year, so July 1, I changed companies. A few days later, I went up in the woods as an assistant engineer, looking after the bridge construction and station work on a logging railroad for the Winton Lumber Company. Owing to the fact that it was a short season in the woods, my work was finished in three months. I came home and went to work grading and scaling lumber in the shipping department of the Winton Lumber Company. I expect to be in town until the woods operations are resumed. I am not married, but I presume a charge will be fronting me in a few years, as I think it is the one ambition of every young man; also older ones."

Fred B. Chamberlin, Ex '23, writes: "I have been with the Pacific Spruce Corporaton, Toiedo, Oregon, since it was organized My capacity now is that of cook and rooming house manager. I have charge of all distributions of time and look after hiring of men. All of this keeps me out of mischief.

Roy Russel Webster (R. C.) '15-16, says: "I am at present working for the Rubedew Lumber Company at Post Falls, Idaho. However, during the summer, I have a steady position with the Post Falls Box and Mfg. Company. I am married."

T. D. Cowan, (R. C.) '15-16, entered the U. S. Forest Service as ranger in the spring of 1917. In Oct., 1917, was furloughed for military service. Spent 18 months over seas with engineering regiment. July, 1919 returned and was reinstated in government service. Is now employed on the Targhee National Forest in Southern Idaho.

Edwin E. Newkirk, (R. C.) '16-17, writes: "For the past year, I have been in the government mail service and at present am a substitute railway mail clerk in the St. Louis Terminal. I am still single and poor. My greatest ambition is to eventually establish myself in the northwest. I have never lessened my enthusiasm about Idaho and am planning to return to Moscow next fall."

Ernest M. Martin, (R. C.) '19-'20, says: "I will be employed as Forest Guard on the Weiser National Forest this coming summer. At present, I am going to Weiser High School, but am still looking forward for a regular course in the Idaho School of Forestry."

Albert C. White, (R. C.) '19-'20, writes: "I have only recently been discharged from the Veteran's Hospital in Boise where I have been for the last nine months, receiving treatment for disabilities received while in service. I am feeling much better now and hope to get into the harness again."

V. R. Hallcraft, (R. C.) '20-'21 says: "I can say that I have met with every success since leaving the U. of I. I took the Forest Ranger examination October 25, last and thanks to my university training, passed with a good mark. I was stationed on the Payette National Forest last year and have just received instructions to report May 16 next, to the same station. I expect an appointment this summer."

Edwin C. Rettig, '19, visited the school early in April. He is still with the Clearwater Timber Protective Association.

Tom Jackson, '19, had a paper on "The Value of University Training to the Logging Engineer" read before the Pacific Logging Congress at San Francisco last October.

H. W. Staples, '20, is now operating assistant of the gold dredging operations of the Yukon Gold Co. at Murray, Idaho.

J. P. Drissen '21, and C. R. Patrie, '21, spent several months during the winter doing graduate work at the school after timber sale work on the Coeur d'Alene National Forest closed down. Drissen has now accepted an appointment as Scaler with the U. S. Indian Service at Chiloquin, Oregon, and Patrie is an inspector for the White Pine Blister Rust control under the Bureau of Plant Industry, with headquarters at Portland, Ore.

O. C. Munson, '21, after hanging telephone lines upon the cliffs in the south fork of the Salmon River country last summer, migrated to Los Angeles, Cal., where he again took up telephone construction work.

Frank A. Brown, '22, will be engaged during the summer with the Bureau of Plant Industry, scouting for White Pine Blister Rust in north Idaho.

J. W. Farrell, '22, has accepted an offer for employment with the Boise Payette Lumber Co., Emmett, Idaho. He will spend the summer on fire protection but hopes to get into the manufacturing end of the business in the fall.

W. B. Miller, '22, who has an appointment with the U. S. Forest Service as Grazing Assistant, will be chief of a grazing reconnaissance crew on the Filmore National Forest in Utah this summer.

Herman Bauman, '23, will be a member of the fire survey party which will continue the reconnaissance of the burned portions of the Clearwater National Forest this summer.

A. S. Daniels, '23, will go back to his old job as commissary clerk on the Selway National Forest this season.

Paul Gerrard, '23, was forced to leave school during April when his leave of absence from the U. S. Forest Service was cut short by his promotion to the position of Fire Assistant on the Clearwater National Forest.

Russell Parsons, '23, will go back to the Selway National Forest this summer to continue work on the extensive reconnaissance initiated last year.

J. W. Rodner, '23, one of the regular lookouts for the Coeur d'Alene Timber Protective Association will resume his old post again this season.

A. M. Sowder, '23, has a job for the summer in the woods with the Edward Rutledge Timber Co., of Coeur d'Alene.

J. W. Stoneman and Leslie Eddy, '23, will return to the Clearwater National Forest for fire duty this season. Edwin Chamberlin, '24, who had to drop school at the end of the first semester for financial reasons will also return to the Clearwater organization this year.

A. N. Cochrell, who attended the ranger course this year now is in charge of the Oxford District on the Clearwater National Forest. F. W. Shaner and Ray Ferguson, both of the Federal Vocational Course, will be on Cochrell's district this summer.

The Clearwater National Forest will also take Lewis Cummings, '25, as lookout and Guy V. Williams, '25, as smoke-chaser this season.

Murl Markham, '24, and Don Fisher, '25, are engaged for the summer by the Nez Perce National Forest.

Earl Bradfield, '24, has secured summer's work on the Coeur d'Alene National Forest.

Walner Peterson, '24, will be employed in

the plant of the Potlatch Lumber Co., again this summer.

Ralph Space, '24 and Ralph Hand, (R. C.), have summer jobs on the St. Joe National Forest.

George Madlinger, '24, will be engaged as smokechaser at the Priest River Experiment Station for the summer.

Paul Harlan, and Howard Kent, '25, will remain in Moscow during the summer to attend the University summer school.

D. S. Man, '25 who comes from India plans to spend the summer checking up on the stories he has heard of the wonders of California.

John H. Zuver, '25, will return to his home in Indiana for the summer vacation.

Paul Bieler, (R. C.)has work for the summer as smoke-chaser on the Payette National Forest.

Stanley Bartlett, (R. C.) has returned to his home in Maine and expects to be employed by the state forestry department this summer. One of his poems was published in "American Forestry" for April, 1922.

Ben C. Maxwell, (R. C.), has a position on the Wenatchee National Forest, Wash.

Neal Poynor, (R. C.), will probably work on the Weiser National Forest again this summer.

R. M. Rudesill, (R. C.), returned to his home in Pennsylvania upon the completion of his work here.

Lawrence Autrey, Lester Eby, Howard Higgins and George W. Clark have been assigned to the Umatilla National Forest, Pendleton, Oregon for the summer.

The Colville National Forest, Wash., will use Norman E. Taylor, Joseph Hamel, Frank Folson and L. H. Melchisedeck this summer.

Lawrence Luby and France Reuterskiold will go to the Caribou National Forest and L. E. Willey to the Chelan National Forest, Wash., for the summer.

John B. Taylor, U. S. Forest Examiner, Missoula, Mont., and former instructor in grazing here, visited the University early in May, a train wreck affording him the opportunity to stop over and renew old acquaintances.

Willard Storms, Ex '23, after spending several months at the Federal Hospital at Whipple Barracks, Prescott, Ariz., was married at Christmas time and is now at his home in Rupert, Idaho.

Orrin Gudmunsen, '25, will be a member of a grazing reconnaissance party on the Cabinet National Forest, Montana.

Cecil Ryan, '23, Earl Bradfield, '24, and Elva Snow, '24, will be members of a party in charge of Dr. Schmitz, scouting for White Pine Blister Rust in North Idaho.

ROSTER OF STUDENTS

The following is a list of students in actual attendance at the School of Forestry during the year 1921—1922. The information after each name is in the following order:1, name; 2, home address; 3, fraternity; 4, honorary fraternity; 5, scholastic achievements and athletics.

GRADUATE.

Drissen, John Phillip; Harrison, Idaho; Xi Sigma Pi; President Associated Foresters, 1920-21; Associate Editor, "Idaho Forester", 1920 and 1921.

Patrie, Carthon Roy, 7 Plymouth St., Plymouth, Wisconsin; Xi Sigma Pi; Editor, "Idaho Forester", 1921.

Sharma, Parmeshri Das; Imperial Forest College of Dehra Dun, India.

1922

Brown, Frank A., 308 State St., Boise, Idaho; Kappa Sigma; Sec. Treas. Associated Foresters, 1918-1919; Associate Editor, "Idaho Forester", 1920 and 1921; Vice President, "I" club 1920-1921; Football, "I", 1919, 1920 and 1921.

Farrell, James W., New Meadows, Idaho; Phi Gamma Delta; Xi Sigma Pi, Alpha Zeta; Sec. Treas. Associated Foresters, 1919-20, Vice President Associated Foresters, 1920-21, Editor "Idaho Forester", 1920, Ass't. Bus. Mgr., "Gem of the Mountains", 1922.

Miller, William Byron, Stevenson, Wash.; Xi Sigma Pi, Alpha Zeta, Editor, "Idaho Forester", 1922.

1923

Bauman, Herman, Milwaukee, Wisc., Xi Sigma Pi; President, Associated Foresters, 1921-22.

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

Gerrard, Paul Henry, Vancouver, Wash., Beta Theta Pi; Xi Sigma Pi.

Melick, Harvey Ivan, Nampa, Idaho.

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

Parsons, Russell Wm., Moscow, Idaho; Beta Theta Pi; Xi Sigma Pi; Asst. Bus. Mgr., "Idaho Forester", 1922.

Rodner, Jack W., Moscow, Idaho; Sigma Alpha Epsilon; Vice Pres. Associated Foresters, 1921-22, Assoc. Editor, "Idaho Forester" 1922.
Ryan, Cecil C., Moscow, Idaho; Kappa Sigma.
Sowder, Arthur M., Coeur d'Alene, Idaho.
Stoneman, J. Warren, Hillyard, Wash.; Sigma Alpha Epsilon; Track "I" 1921.

1924

Bradfield, Earl Francis; Pocatello, Idaho.
Chamberlin, Edwin William, Moscow, Idaho.
Chamberlin, Cecil, Kendrick, Idaho.
Eddy, Leslie Eugene, Moscow, Idaho. Business Manager, "Idaho Forester", 1922.
Edwards, Kenneth D., Nampa, Idaho. Phi Delta Theta.
Madlinger, George J., Poughkeepsie, New York; Business Manager, "Idaho Forester" 1921, Assoc. Editor, "Idaho Forester" 1922.
Markham, Murl J., Grangeville, Idaho. Sigma Alpha Epsilon.
Nicol, Henry, Reubens, Idaho.
Peterson, Walner L., Potlatch, Idaho.
Snow, Elva A., Boise, Idaho. Kappa Sigma.
Space, Ralph; Weippe, Idaho.
Wetherbee, Lawrence E. Chicago, Ill.

1925

Connors, John; Prichard, Idaho.
Cummings, Lewis; St. Petersburg, Fla.
Doyle, Ivan; Moscow, Idaho.
Fisher, Don C., Grangeville, Idaho. Kappa Sigma.
Goddard, Charles Vance, New York, N. Y.
Green, Edwin G., Moscow, Idaho.
Gudmunsen, Orin Sylvester; River Falls, Wis.
Harlan, Paul McLean; Jackson, Tenn. Kappa Sigma.
Holbrook, Frank C.; San Francisco, Cal. Kappa Sigma.
Kaufman, James E.; Orofino, Idaho.
Kent, Howard A.; Bonners Ferry, Idaho. Kappa Sigma.
Man, D. S.; India.
Pearce, Paul Stanley; Spokane, Wash.
Williams, Guy K.; Boise, Idaho. Sigma Nu.
White, Harold Z.; Moscow, Idaho.
Zuver, John H. Jr., South Bend, Ind.

Unclassified

Autrey, Lawrence; Hauser Ferry, Wash.
Bloss, Frank; Portland, Ore.
Clark, George Wm.; Toushet, Wash.
Eby, Lester W.; Walla Walla, Wash.
Ferguson, Ray S.; Clarkston, Wash.
Folsom, Frank B.; Elizabethton, Tenn.
Franklin, A. A.; Harrison, Idaho.
Hamel, Joseph Henry; Bremerton, Wash.
Higgins, Howard H.; Fredricktown, Ohio.
Jones, Lloyd A.; Monida, Mont.
Linck, Arthur R.; Boise, Idaho.
Luby, Lawrence L.; Idaho Falls, Idaho.
Melchisedeck, L. H.; Moscow, Idaho.
Perkins, Glen C.; Pocatello, Idaho.
Perkins, Parley; Dayton, Idaho.
Reuterskiold, France; Ft. Atkinson, Wisc.
Runberg, Victor; Potlatch, Idaho.
Shaner, Fred William; Orient, Wash.
Southard, Fred C.; Moscow, Idaho.
Taylor, Norman E.; Oroville, Wash.
Van, George; ——
Wheeler, Byrl; Weiser, Idaho.
Willey, Lewis Edwin; Thornton, Wash.

Ranger Course

Bartlett, Stanley Foss; Locke Mills, Me.
Bieler, Paul; Jersey City, N. J.
Cochrell, Albert N.; Greer, Idaho.
Hallcraft, Vernon Ralph, New Meadows, Ida.
Hand, Ralph L.; Ashville, N. Y.
Humm, Howard M., Colorado Springs, Colo.
Kelly, Robert C.; Bradford, Pa.
Maxwell, Ben C.; Waynesville, N. C.
Poynor, Neale E.; Council, Idaho.
Rudesill, Ralph M. Bradford, Pa.

ALUMNI AND FORMER STUDENTS

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

Allen, Thomas Wm.; Ex-'22.
Anderson, Mark, Ex-'15; Provo, Utah. (Hotel Manager.)
Ashton, Allen White; Ex-'22.
Barger, Harold B, Ex-'17; Browning, Mont.
Bedwell, Jesse Leonard, '20 B. S. (For.); Council, Idaho. (U. S. Forest Ranger, Caribou National Forest.)
Berry, Waldo Lee, (R. C.) '15-'16; Post Falls, Idaho.
Brockman, Cecil C., Ex-'23; Bickelton, Wash.
Buckingham, William E., m, Ex-'22 Gifford, Idaho. (Ranger, U. S. F. S., Orofino, Idaho.)
Burns, Robert Owen, Ex-'15; Payette, Idaho. 625 Hoymount, Fayelleville, N. C.
Cable, Guy Burr, Ex-'22; Roberts, Idaho.
Chamberlin, Fred, Ex-23; Coeur d'Alene, Ida. (Pacific Spruce Corp., Toledo, Ore.)
Chamberlin, Gail B., Ex-'22; Coeur d'Alene, Idaho. (Winton Lumber Co.)
Carlson, Oscar, '15, B. S. (For.), deceased.

Cook, Jacob Miller, Ex-'20; Oberlin, Kansas.

Cooper, Alfred, Ex-'20; Los Angeles, Cal.

Core. Glenn R. Ex-'23; Burley, Idaho.

Cossitt, Floyd Morgan; Weiser, Idaho. (U. S. F. S., Kooskia, Idaho.)

Cowan, Talmadge D., (R. C.) '15-'16. U. S. Forest Ranger, St. Anthony, Idaho.

Cross, Sidney W., Ex-'23.

Cunningham, Russell N., '17 B. S. (For.), U. S. Forest Service, Missoula, Montana.

Darnall, Glenn McClellan, Ex-'16; Payette, Ida.

Darrah, Lionel Leonard, (R. C.) '20-'21; Moscow, Idaho.

Dart, William Ellisworth, Ex-'20; Moscow, Idaho.

Daugherty, Charles Ira, Ex-'22; Challis, Ida.

Davis, Roscoe Richard, Ex-'21; Star, Idaho.

Decker, Arlie Delos, '13 B. S. (For.), M. F. Yale University, '17. (Land Agent, Potlatch Lumber Co., Potlatch, Idaho.)

Denning, Steward K., Ex-'13. 3-22 3067-Bateman St., Berkeley, Cal.

Dipple, Ralph, Ex-'14. (Dentist, Springfield, Oregon.)

Dodge, Keith Allen, (R. C.) '15-'16; Challis, Idaho.

Drissen, John Philip, '21, B. S. (For); Harrison, Idaho. (U. S. Indian Service, Klamath, Oregon.)

Duncan, Robert, (R. C.) '16-'17.

Eldridge, Ferris Edwin, Ex-'18.

Elhart, Carlton D., Ex-'22; Caldwell, Idaho.

Evans, Philip Smith, Ex-'20; Preston, Idaho.

Faucett, Vernon, Ex-'14.

Favre, Clarence Eugene, '14 B. S. (For); '15, M. S. (For), (Supervisor, Humboldt National Forest; Elko, Nevada.)

Fenn, Lloyd Alfred, '11 B. S. (For.), Kooskia, Idaho; (Attorney at Law; Manager, "Kooskia Mountaineer".

Fields, Charles Carlos, Ex-'14.

Flyg, Carl Jacob, (R. C.) '20-'21; Shelley, Ida.

Fuller, Harry E., Ex-'24; Emmett, Idaho.

Gildea, Howard Cecil, Ex-'14; McMinnville, Oregon. (Lawyer.)

Gavin, C. H., Ex-'23; Heise, Idaho.

Gilman, John Elmo, Ex-'19; Obsidian, Idaho, via Stanley.

Griep, Kenneth, Ex-'24; Fruitland, Idaho.

Hamilton, William Howard, Ex-'22; Santa Paulo, Cal.

Hamilton, Richard Alverd, Ex-'19; Orofino, Idaho.

Hammond, George M., Ex-'20; Pocatello, Idaho. (Bowerman Lumber Co.)

Haladay, Howard Wesley, Ex-'16, Deceased.

Hanzen, Maurice Henry, Ex-'20; Moscow, Ida.

Hart, Irving Warren, Ex-'22; Boise, Idaho.

Haynes, Ralph M., (R. C.) '16-'17; Emmett, Idaho.

Headick, Ralph Alonzo, (R. C.) '16-'17; Moscow, Idaho.

Heard, Herman Claude, Ex-'13. —'19—County Agent, Phoenix, Arizona.

Helfrich, Will Edward, Ex-'15.

Herman, Charles Henry, '13 B. S. (For.) Enterprise, Ore. (Manager, East Oregon Lumber Co., Enterprise, Oregon.)

Hillman, Wm. P., Ex-'13.

Hockett, Robert Vestal, Ex-'13.

Humphrey, Clyde Pearson, Ex-'17; Coeur d'Alene, Idaho. (State Highway Dept.)

Huestis, Clarence, (R. C.) '16-'17; Council, Idaho.

Hyde, Clarence Otis, Ex-'19; Oreana, Idaho. (Bank Clerk, Spokane, Wash.)

Jackson, Tom, '19 B. S. (For.); Clarkia, Ida. (Logging Eng, Edw. Rutledge Timber Co.)

Jensen, Irving R., (R. C.) '16-'17; Essex, Mont. (U. S. Forest Service)

Johanson, Robert, (R. C.) '20-'21; Orofino, Idaho.

Johnston, Herbert Wm., Ex-'17; U. S. Biological Survey, Unalakleet, Alaska. (Range Investigations).

Joke, J. A., (R. C.) '15-'16; Moscow, Idaho.

Jones, Renaldo Vincent, Ex-'15; Albion, Ida.

Jones, William McKinley; Nampa, Idaho.

Kambridge, Antone J., Ex-'16; (Farmer) Genesee, Idaho.

Keefe, Frank, Ex-'15.

Keyes, George W., Ex-'22; Challis, Idaho.

King, Leonard Austin, (R. C.) '20-'21; Orofino, Idaho.

Kingan, Fred, Ex-'22.

Lommason, Thomas, Ex-'17, U. S. F. S., Ogden, Utah (Grazing Assistant).

Lundstrum, F. J., '11 B. S. (For.); Lewiston, Idaho. '16—633 Shatto Place, Los Angeles, California.

McMullin, George Leiby, Ex-'18; 251 Bush St., San Francisco, Cal. (Stationery Specialties).

McNett, Gail, Ex-'16; Rathdrum, Idaho.

Martin, Ernest M. (R. C.), '19-'20; Weiser, Idaho.

Martin, Paul J., Ex-'19; 1200 Old National Bank Bldg., Spokane, Wn., (Insurance Bus.)

Maruska, Joseph, (R. C.) '20-'21; Sandpoint, Idaho.

Massey, Ivan M., Ex-'23.
May, Henry W., (R. C.) '19-'20.
Malmsten, Henry Elof, '17 B. S. (For.) U. S. F. S., Ogden, Utah. (Range Investigations).
Melzian, Wesley, (R. C.) '20-'21; Sleepy Eye, Montana.
Miller, Lilas Warren, Ex-'22; Nampa, Idaho.
Miller, Robert Adolph, Ex-'22; Twin Falls, Idaho.
Moody, Virgil Carlton, '17 B. S. (For.), Hope, Idaho.
Morris, Leo Francis, Ex-'16; Weiser, Idaho. —408 Savings & Loan Bldg., Spokane, Wn.
Morrison, Frank Bernard, Ex-'22; Barber, Ida.
Munson, Oscar C., '21 B. S. (For.), Moscow, Idaho.
Myrick, E. H., Supervisor, Lewis & Clark National Forest, Choteau, Montana.
Nero, Edward T., Ex-'22; Moscow, Idaho. (U. S. Forest Ranger, Orofino, Idaho).
Newkirk, Edwin Ely, (R. C.) '16-'17, St. Louis, Mo. (Railway Mail Clerk).
Nonini, Amerigo Louis, (R. C.) '16-'17, Mackay, Idaho.
Parsons, Ralph Howard, Ex-'14, U. S. F. S., Coeur d'Alene, Idaho. (District Ranger).
Patrie, Carthon Roy, Plymouth, Wisc., U. S. Bureau of Plant Industry, Spokane, Wash., (Blister Rust Inspection).
Pederson, Arthur R., Ex-'22; Kootenai, Idaho.
Peterson, Raymond E., Ex-'24; Moravia, Ida.
Post, Claude H., Ex-'22.
Rae, Chas. Arthur, Ex-'14. Dentist—St. Maries, Idaho.
Ramsburg, G. F., Ex-'23; Weston, Va.
Redinger, Clyde Edison, Ex-'21; Adams Basin, New York.
Rettig, Edwin Claire, '19 B. S. (For.); Orofino, Idaho. (Clearwater Timber Protective Association).
Roeder, Charles, (R. C.), '20-'21; Streator, Ill. (High School, Moscow, Idaho).
Ruckweed, Fred John, '17 B. S. (For.), Plymouth, Wisc. 12-21-21 Gettysburg Pub. Schools, Gettysburg, S. D.
Russell, Raymond E., Ex-'22.
Rutledge, Walter T., Ex-'16; Nyssa, Oregon.
Salvin, Otis William, Ex-'19; Carmen, Idaho.
Schofield, Wm. Robert, '16 B. S. (For.); Chinook, Mont. (County Surveyor).
Schroeder, Bert H., Ex-'16; Cottonwood, Ida.
Shanner, Wm. W., Ex-'22.
Shipman, Orville H., (R. C.), '16-17; Boise, Idaho.
Sievers, Lawrence, (R. C.) '20-'21; Moscow, Idaho.
Slavins, Erwin Howard, Ex-'20; Spokane, Wn.
Smith, Harley Roscoe, Ex-'14.
Staples, Howard W., '20 B. S. (For.) Moscow, Idaho.
Stevens, Arthur W., '15 B. S. (For.); 1830 Sharp Ave., Spokane, Wash.
Stillinger, Chas. Roy, Special '19. U. S. Bureau of Plant Industry, Spokane, Wash.
Stone, Capt. Lawrence Fielding, Ex-'15. Commanding Officer, Arcadia Balloon School, Arcadia, Cal. (Home in Monrovia).
Storms, Willard Sidney, Ex-'23; Rupert, Ida.
Swan, Hugh Harris, Ex-'15; Sherbourne, N. Y.
Teed, Ryle, 428 P. O. Bldg., Portland, Oregon. (U. S. Forest Examiner).
Telford, Milton McKinley, Ex-'20; Coeur d'Alene, Idaho.
Thornton, James A., Ex-'12.
Throckmorton, Michael Reed, Ex-'24; Rupert, Idaho.
Oylear, Clarence H., Ex-'21; Middleton, Idaho.
Vick, Ernest Raymond, (R. C.) '19-'20; Watford City, N. D. (U. S. F. S., Luther, Mont.)
Wadsworth, Herbert A., '11 B. S. (For.) Maj., U. S. Inf., Fort Howard, Md.)
Walker, Everett Foster, Ex-'23; Moscow, Ida.
White, Albert C., (R. C.) '19-'20; Boise, Idaho., R. F. D. No. 1.
Williamson, Chas. Leonard, Ex-'14. (N. Western Mgr. for Powers Regulation Co., Chicago), 318 Alaska Bldg., Seattle, Wn.
Webster, Roy Russell, (R. C.) '15-'16; Post Falls, Idaho., (Rubedew Lumber Co.)
Welker, Leonard, (R. C.) '20-'21; New Holstein, Wisconsin.
Williams, John, (R. C.) '16-'17.
Wiseman, Claude C., Ex-'22; Middleton, Ida.
Wolfenden, William, Ex-'23; Gooding, Idaho.
Yates, Donald, '17 B. S. (For.); Potlatch, Ida., (Land Dept., Potlatch Lumber Co.)
Youngs, Homer Smith, '17 B. S. (For.); Deceased.

A WORD OF APPRECIATION

The editors of THE IDAHO FORESTER wish to express their sincere appreciation of the kind assistance and cooperation on the part of contributors and advertisers which have made possible the publication of this booklet.

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