The Forestry Kaimin

School of Forestry, State University of Montana
At Missoula
Published by The Forestry Club.
The University of Montana

Edward C. Elliott, Chancellor of the University

The University of Montana is constituted under the provisions of Chapter 92 of the Laws of the Thirteenth Legislative Assembly, approved March 14, 1913 (effective July 1, 1913).

The general control and supervision of the University are vested in the State Board of Education. The Chancellor of the University is the chief executive officer. For each of the component institutions there is a local executive board.

Montana State Board of Education

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The University comprises the following institutions, schools and departments:

The State University, Missoula
Established February 17, 1893, and consisting of:
The College of Arts and Sciences
The School of Law
The School of Pharmacy
The School of Business Administration
The School of Music
The Biological Station (Flathead Lake)
The Public Service Division

Charles H. Clapp, President

The State College of Agriculture and Mechanic Arts, Bozeman
Established February 16, 1893, and consisting of:
The College of Agriculture
The College of Engineering
The College of Applied Science
The College of Household and Industrial Arts
The School of Music
The Summer Quarter
The Secondary School of Agriculture
The Agricultural Experiment Station
The Agricultural Extension Service

Alfred Atkinson, President

The State School of Mines, Butte
Established February 17, 1893
Courses in Mining Engineering
Courses in Metallurgical Engineering
Bureau of Mines and Metallurgy

George W. Craven, President

The State Normal College, Dillon
Established February 23, 1893, and consisting of:
The Teachers’ Certificate Course
The Three-years’ Course
The Course for Supervisors

Sheldon E. Davis, President

For publications and detailed information concerning the different schools and colleges address the president of the particular institution concerned. Communications intended for the Chancellor of the University should be addressed to the State Capitol, Helena, Montana.
God has lent us the earth for our life. It is a great entail. It belongs as much to those who are to come after us as to us, and we have no right, by anything we do or neglect, to involve them in any unnecessary penalties or to deprive them of the benefit which was in our power to bequeath.—Ruskin.

I pledge allegiance to my Flag and the Republic for which it stands, one nation, indivisible, with liberty and justice for all.

THE FORESTRY KAIMIN
A JOURNAL OF WESTERN FORESTRY PRACTICE PUBLISHED AS A UNIVERSITY BULLETIN BY THE FORESTRY CLUB IN THE SCHOOL OF FORESTRY OF THE STATE UNIVERSITY AT MISSOULA, MONTANA

Editor .......................................................... Frank E. Hutchinson
Associate Editors .................................................. H. E. Schwan, C. A. McDonald, Ed Madsen, H. H. Hoyt, Earl Tennant

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TIMBER TAXATION

Our present method of taxing timber land is, it seems to the writer, a greater menace to the conservation of our western forests even than forest fires. It is freely conceded that so long as timber land is taxed on the basis of the value of the timber crop and not on the basis of the value represented in the productive and earning capacity of the land just so long will any practice of forestry be impossible on the part of timber land owners.

A tax levied each year on the same crop of timber piles up growing stumpage costs increasing at a compound rate of interest which is necessarily passed on from lumber producer to consumer in steadily increasing lumber prices.

An average acre of productive timberland in the Inland Empire might produce each year some 100 board feet of pine timber worth on the stump not more than thirty cents. If this were farm land its value, indicated by its earning capacity would be in the neighborhood of $6 per acre so long as the farmer could produce crops or pasture on the land which would represent net earnings of five or six per cent on that value.

As timber land the land is taxed for this value, a grazing value is likely to be added and to this is added the value of the crop as it increases from year to year. When the timber crop is mature and ready to cut the crop alone will have paid in taxes almost twice as much, at the rate of our usual levies, as the final crop is worth. One need not be what a lumberman acquaintance of ours is wont to term "A Greek and Latin scholar" to realize that the value of the timber crop is confiscated long before it is ready to cut.

If a farmer was compelled by the nature of things to store on his farm for one hundred years all the wheat produced on the land and to pay each year taxes of from one percent to two percent of the net value of the grain he would in sixty or seventy years have paid more in taxes than the grain could be sold for and at compound interest the taxes would have amounted to four times what he could sell the grain for at the end of the one hundred years.

This is exactly what the lumberman is doing. Naturally he is in a hurry to cut his timber. Conservation means confiscation. To leave the cut over land in shape for further forest growth would lead to bankruptcy. To care for young growth or reproduction on cut over lands only adds more costs to be compounded with taxes.

Who cares? The escheated and confiscated land can be added to State and National forests. On forest protection week we can hurrah for the fire fighters—yet we venture to prophesy that when this country takes up forest conservation genuinely and in earnest, private forestry practice will form the backbone of the Nation's forests, as it has abroad, where forest tax law are different.

FORESTRY AND THE BOY SCOUTS

No great movement can succeed without advertising. This axiom holds true of forestry as of anything else. In order to accomplish the great aims of its founders, the forestry idea must be firmly planted in the minds of all citizens, so that the Forest Service may be heartily backed up in its program by an enlightened, sympathetic, public opinion. Therefore the Service has established an office of Public Relations to sell the forestry idea to the public.

But it is very important that not only the present but the future citizens of the country have the forestry idea heartily in mind, for all forestry is a working for the future. The best way to reach the rising generation is through the Boy Scouts. This organization has the highest of ideals regarding conservation and forestry, and is perhaps the greatest single factor existing for shaping in the mind of Young America of a realization of the obligation of a nation to its citizens, both present and to come, in the conservation of the natural resources. Therefore it should be the aim of every forester to help this organization in every possible way. This can be done by lectures and demonstrations to local troops, showing the ravages of fires, how to avoid this loss, proper use of the forests, wood craft, and so on. And in this way foresters may be of great benefit to the community.

But there is yet a higher service than this open to all forest officers and students.

The movement is handicapped, by the lack of capable men to carry on its work. Good scoutmaster material is scarce so that many boys are forced to lose the Boy Scout training through lack of necessary direction. Here is the chance of the Forester and of the Forest School student to help the Scouts along. In towns where troops are already organized, scoutmasters and assistants are always in demand. Foresters make good men for such
work, because of their knowledge of woodcraft and the handling of men. In unorganized districts the local Forest Officer can line up the boys in his neighborhood and get them started along the road of Scouting.

This work with boys is sure to be greatly appreciated by them and at the same time is of value to the forester, in that it develops the valuable quality of handling men, for a man who can successfully handle boys is well equipped to handle a crew of wobblies or any other tough proposition.

There are now two or three men at the Forest School who are doing work along this line, either in Missoula during the school year, or in their summer locations. It would be a good thing for the forestry movement and for the men themselves if more of the students would devote some time to this work. While not remunerative it is good, clean, enjoyable labor, and the individual has the satisfaction of knowing that he is discharging in a most efficient way his responsibility of those who will some day rule the nation.

**EXPERIENCE vs. EXPERIENCE**

Does a student gain worth-while experience in proportion to the number of localities in which he works?

By locating on a different forest each season he comes in contact with a greater variety of subjects, more methods of conducting the same activities are brought to his attention. He sees a larger range of conditions and should absorb many new ideas.

On the other hand, he requires at least a season to become acquainted with users, country, conditions and weak points in the Forest's administration. The bulk of this knowledge is never capitalized, however, and is therefore, non-productive. A year is consumed in gaining thorough knowledge of conditions and the confidence of his employer. Freedom in conducting the job, earned by a year's dealing with the administration, furnishes an opportunity to exercise initiative, to carry greater responsibilities, to enjoy doing things with one's own resourcefulness and ingenuity.

Moving to a new locality each season often means another year as a ranger’s errand boy; another year building a reputation, which unless capitalized, brings him small returns, to say nothing of the loss to the Forest which paid the guard to gain experience.

Although a Forestry student has many advantages not possessed by others, it must be realized that a Forest will gain little comfort from these special qualifications until the student become familiar with local conditions.

Almost invariably a practical local man does the Service more good the first year than a specially trained man from the outside.

One of the weakest phases of the guard system is the enormous waste due to rapid turn over in personnel. In other words, much money is spent in training men who never give anything back to the parties investing in their training. Linked with this is the tendency for students to overlook the loss to themselves as well as to their employer when they desert the foundation they have laid to build another somewhere else; when they neglect and abandon the experience gained rather than make an investment of it which will yield good returns.

With the un-employment situation to deal with and with prospects good for many practical local men being available, students will find a much keener competition for guard and ranger positions in the future.

They should make their services and special qualifications as productive as possible, for their own welfare and also for the general cause of Forestry.—Dana Parkinson, Supervisor, Wasatch Forest.

**OUR NEW SCHOOL**

After years of hoping and waiting our new building is at last a reality. Next September we will move into one of the best equipped Forestry School buildings in the United States. We will have several thousand dollars worth of new equipment, and an increased faculty with its ideal location in the National Forest region. No school in the United States will have better advantages. How the school grows and develops and what reputation it builds will depend entirely upon its students, you men who are here now, and those who will come later. A school is judged by its students, and Montana forestry school is being constantly judged by the dealings of you men individually with all men of your chosen profession.

Most of us depend on summer work with the Forest Service for field experience, and for money to go to school on. The Service has gone a long way in its policy of hiring students, even arranging its schedule to fit the students’ vacation. It is the duty of the student to meet the Forest Service half way. A few cases have been known where a student, after working a month or two, would take a vacation, and cruise around a little before returning to school. The Forest Officer had spent a good deal of time and money training the employee, hoping that this outlay would be returned by increased efficiency toward the end of the season. Instead, he must break in an entirely new man in the middle of a busy season. A few repetitions of such incidents will soon cause the Service to regard students as undesirable employees.

On the other hand, a student obtains a position on a National Forest, and does good work. The following spring when the rangers and supervisor make out their programs they say, ‘Well, there is X from the Montana Forestry School. We want him again, and also a few more of his caliber. Guess we’ll use Montana men this year. If they are all like him they are worth having.’

Will your supervisor say that about you, Montana student, at the end of this field season, or will he be glad to let you go? On every one of you individually rests the reputation of your school. One slack man will blackball the school over an entire Forest. So hang up a record for hard, intelligent, faithful work this summer. If they are all like him they are worth having.

Will your supervisor say that about you, Montana student, at the end of this field season, or will he be glad to let you go? On every one of you individually rests the reputation of your school. One slack man will blackball the school over an entire Forest. So hang up a record for hard, intelligent, faithful work this summer. If they are all like him they are worth having.

Men of Montana, it’s up to you.
The School

The work of the Montana School of Forestry is along two distinct lines—undergraduate courses of four years which provide liberally for specialization in all the various branches of Forestry and Forest Engineering, and a short course of 12 weeks for Forest Rangers.

The undergraduate courses are arranged to train men for the various branches of scientific and administrative work in the government forest service and for work with lumber companies and timber-owning corporations involving the administration, protection, and utilization of forests. The work is arranged to allow for specialization in Forest Administration, Lumbering, Forest Engineering, Silviculture, Forest Management, and Grazing Management.

Graduate training, leading to the degree of Master of Science, is offered in Silviculture and Forest Management.

The ranger school is organized for the special purpose of training men already in woods work to do better service in forestry and particularly to improve the training of forestry officers. Distinctly, it is not a course for inexperienced men.

A forestry club with a student and faculty membership of more than 100 meets fortnightly for the discussion of forestry problems, the consideration of technical and professional papers and the promotion of a social spirit.

Advisory Board

At the annual meeting of the Pacific Coast Logging Congress in 1917 it was proposed to create an Advisory Board for each of the Forestry Schools in the western states. This board was to consist of prominent lumbermen and members of the U. S. Forest Service who would co-operate with the faculty of the School of Forestry in formulating an educational policy which would meet with the approval of both the lumbermen and Forest Service. In consequence of this proposal, the State Board of Education authorized in December, 1917, the creation of a special committee representing the lumbering interests and forestry activities to co-operate with the officers of the School of Forestry.

The advisory committee of the Montana school consists of the following members: Kenneth Ross, General Manager Lumber Department, Anaconda Copper Mining Co., Bonner, Mont.; W. R. Ballard, General Manager, Somers Lumber Co., Somers, Mont.; Fred Morrel, District Forester, District 1, U. S. F. S., Missoula, Mont.; E. G. Pelley, Pelley Lumber Co., Missoula, Mont.

Advantageous Location

The Montana School of Forestry possesses marked advantages in the matter of location. Every forest type of the inland northwest is found within a few miles of the school. Two transcontinental railroads, three branch railroads and two interurban electric lines place the school within easy reach of extensive lumbering and lumber manufacturing operations.

The headquarters of District 1 of the United States Forest Service and the offices of two forest supervisors are located in Missoula. The boundaries of the Lolo National Forest, the Bitter Root National Forest and the Missoula National Forest are adjacent to the school and include more than 3,000,000 acres of government timber lands, under forestry management. Within 50 miles of the school are the boundaries of nine national forests and two other government timber reserves. Within 100 miles are the boundaries of seventeen national forests, three other government timber reserves and a national park.

Summer Work.

One of the most important features of the School of Forestry is the opportunity which the students have for summer work. Each student is expected to spend not less than three months of each year in gaining practical experience in some form of woods work. The officials of the U. S. Forest Service and the lumber companies assist in placing the men for their first summer’s work; their promotions through the succeeding vacations and positions after graduation are, therefore, entirely dependent on their own effort and ability.

It will be seen that this co-operative arrangement is most satisfactory; the student graduates as an experienced man, and while gaining his experience he has also earned money to pay for his college course.

Field Courses

To a great extent the work of the School of Forestry is carried on in the field and forest. Classes in Silviculture and Forest Management utilize the various forest types of the neighboring national forests. Classes in log scaling work on the decks and rollways at the local sawmills. Classes in timber cruising are held almost entirely within the forest. Classes in grazing uses of the forest and in
FORESTRY KA MIN

of Forestry

range management study the local forest ranges and make frequent visits to the
herds and flocks of nearby ranches. Instruction in forage plants is given in co-
operation with specialists from the agricultural college. Use is made of nearby
logging and lumber manufacturing operations by classes in lumbering and logging
engineering.

Classes in forest policy and forest administration are given special opportunity
for observation and investigation work in the offices of the District Forester
of District No. 1 of the Forest Service and in the offices of the three forest super-
sors which are located in Missoula. Experts and specialists in various lines of
forestry are called upon freely for co-operation in the training which is given.

Schedule of Courses in Forestry

FIRST YEAR

<table>
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<tr>
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<tr>
<td>Mathematics</td>
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<tr>
<td>General Forestry</td>
<td>2</td>
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<tr>
<td>Surveying and Mapping</td>
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<tr>
<td>Military Drill</td>
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<tr>
<td>Physical Education</td>
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<td>College Education</td>
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SECOND YEAR

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<tr>
<td>Mathematics or English</td>
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<tr>
<td>General Forestry</td>
<td>3</td>
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<tr>
<td>Surveying and Mapping</td>
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</tr>
<tr>
<td>Military Drill</td>
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<tr>
<td>Physical Education</td>
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THIRD YEAR

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<td>Wood Technology</td>
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FOURTH YEAR

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<tr>
<td>Management</td>
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<tr>
<td>Forest Laws</td>
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<tr>
<td>Logging Engineering or Grazing Management</td>
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<tr>
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SCHEDULE OF COURSES IN FOREST ENGINEERING

FIRST YEAR

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SECOND YEAR

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<td>Forest Measurements</td>
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<td>Logging</td>
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<td>Physical Education</td>
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THIRD YEAR

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</tr>
<tr>
<td>Silviculture</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
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FOURTH YEAR

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<td>Forest Management</td>
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<td>Logging Engineering</td>
<td>4</td>
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<tr>
<td>Electives</td>
<td>4-6</td>
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Electives in Forestry

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<th>Credits</th>
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<td>Forestry Appraisals</td>
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<tr>
<td>Grazing Management</td>
<td>4</td>
</tr>
<tr>
<td>Woodcraft</td>
<td>4</td>
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<tr>
<td><strong>Total</strong></td>
<td>15-17</td>
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</tbody>
</table>

For a part of the spring quarter of each year, the school is moved to the
shores of Flathead Lake in the Flathead National Forest where valuable use
is made of forest and range types not found nearer the school. Various lumbering and wood using operations of that region are studied at this time.

Special Lecturers

The regular faculty of the School of Forestry is assisted by a staff of 30 special lecturers who are experts and specialists in various lines of forestry and forest uses. An unusual opportunity for this is afforded by the location of the Forest Services offices and headquarters in Missoula, and by the lumbering and stock raising industries in western Montana. An especially valuable co-operation is offered by the officers of the Government Forest Service and men prominent in the stock raising and lumbering industries. The Agricultural College at Bozeman is organized as a part of the University of Montana and in the winter quarter of each year experts from that school and from the Government Agricultural Experiment Station are detailed to the School of Forestry as special lecturers in the courses in grazing and range management.

Costs of Attendance

No tuition fees are charged. Registration and laboratory fees, membership in student associations including athletics and other extra-curricular activities and fees for supplies and breakage in libraries and laboratories total about $25 for each year. Books and school materials amount to from $20 to $40 per year and may be purchased through a co-operative students' organization. Traveling expenses for field studies will amount to $20 for each year. So far as possible motor transportation is furnished by the school.

All forestry students who are in good standing are profitably employed during the summer quarter of three months each year. Many students are entirely self-supporting during the school year. Any boy who is willing to work can earn a large part of his way through the University. Students should, however, have sufficient money to pay expenses for the first two quarters.

Requirements for Admission

The completion of a four years' preparatory or high school course is the standard for regular entrance to the School of Forestry in the University, as in the other regular courses of the University.

Students in high school and preparatory schools who plan to enter the School of Forestry should preferably include various elementary natural sciences, English, and mathematics in their training. Students intending to specialize in Forest Engineering should also, when possible, include Manual Arts and Drawing in their preparation.

Special Students

Students over 21 years of age, who are not high school graduates and who are not candidates for degrees, may be admitted without the usual entrance credits, as special students, if they are prepared to pursue successfully the special courses desired, subject to the general rules of the University.

Special students may acquire status as regular students and become candidates for degrees by complying with the rules applicable to such cases.

Requirements for Graduation

Candidates for a degree of Bachelor of Science in Forestry must complete 186 credits of work in addition to the regular requirements of the University in Physical Education, Military Drill, and College Education, and, in addition, two summers of regularly approved Field Work. In case a student fails to offer this Field Work he may substitute for it credits earned in residence in the ratio of three credits for each summer of Field Work.

One credit represents three hours of time each week throughout one quarter, occupied in recitations or lectures, and in preparation outside of the class room.
Time given to laboratory or field work is credited on the same basis of valuation, "three hours for one."

The courses leading to the degree of Bachelor of Science in Forestry will require twelve quarters of attendance and extend normally over four years, giving the student three months for summer work each year. Students will be expected to gain practical experience by working for the Forest Service or with lumbering and logging companies during the summer quarter. Students specializing in Forest Engineering are advised to take five years for the course, attending school three quarters each of the first two years, and but two quarters of each of the last three years during specialization.

The courses of training in the School of Forestry are arranged under four branches of forestry:

I. Forest Policy and Administration.
II. Silviculture and Forest Management.
III. Forest Utilization.
IV. Forest Engineering.

The first two years of work as shown in the Schedule of Courses include fundamental courses in mathematics, English, natural sciences, and elementary studies in subjects of general forestry.

Electives in Other Schools and Departments.

In addition to the above courses, students after the freshman year may elect not to exceed 12 credits each year in any school or department of the University, subject to the approval of the faculty of the School of Forestry and of the department in which the work is taken.

The College Education and English requirements are the same as the general University requirement.

SHORT COURSE FOR FOREST RANGERS.

The Ranger School, or special course for forest rangers, begins each year on the first Wednesday in January and continues for twelve weeks.

It is the purpose of this school to improve the training of forest rangers and other forest officers. Men who have either a high school training or some practical experience in forestry work are prepared in this course to pass the civil service examination for forest ranger.

During the course of the Ranger School opportunity is also offered for specialization or short course training in lumbering and logging, scaling and cruising, surveying and mapping, stream gauging, highway and bridge construction and grazing.

The work of the Ranger School is carried on with helpful co-operation from the United States Forest Service. Experts in various branches of forest service work are detailed under authorization of the Secretary of Agriculture as special lecturers in the school. Other state and government officials and experts in the employ of lumber companies assist in the training. Special lectures in grazing are given by the state veterinarian.

Students in the Ranger School who are just beginning their forestry training usually pursue the following courses:
Surveying and Mapping, 4 cr.; Scaling and Cruising, 2 cr.; Fire Protection, 3 cr.; Forest Improvement, 3 cr.; Forest Administration, 3 cr.; Lumbering, 2 cr.; Botany and Silviculture, 3 cr.; Grazing, 3 cr.; General Forestry, 1 cr.

More advanced students and most forest rangers who attend the school elect short courses of training from the following schedule: Advanced Topographic Surveying and Mapping, 2 cr.; Hydraulics, 1 cr.; Logging Engineering, 3 cr.

(Continued on Page Thirty-seven.)
The Forestry Club, including most of the students and faculty of the school, is without doubt the biggest and liveliest social organization on the campus.

Our rapid growth made it necessary last year to adopt a constitution and set of by-laws for governance of the Club. Montana is one of the first Forest Clubs in America to take this step toward formal organization.

The Montana Forestry Club is affiliated with the Intercollegiate Association of Forestry Clubs, an organization which meets annually to discuss Forestry Club affairs and problems. Last year the convention was held at the University of California, and Montana was represented by Mr. Dirmeyer. This year the convention will be held at the New York State College of Forestry at Syracuse.

Membership in the club is limited to students taking the course in Forestry who signify their desire to join it by signing the rolls and submitting to the initiation which is held each year at Spring Camp. The purpose of the Club, as stated in the preamble, is to stimulate interest in forestry matters and to promote good fellowship among the students.

Meetings are held twice a month in the old shack and the program is laid out with a view to securing the objects of the organization. After the business meeting we have an informal talk by an expert on some topic of forestry or kinred matter. And we are exceptionally fortunate in the class of lecturers we are able to secure for our meetings. The United States Forest Service maintains a large force of scientific and administrative experts at the District Office in Missoula, and we have always found these men very willing to talk to us on their individual specialties.

Then follows the social part of the program. The Club is purchasing a piano on the installment plan and several of the members are experts on this and other musical appliances so that we have no lack of harmony. Wrestling and boxing matches, movies, songs by our quartette, and other forms of entertainment are provided. The meeting concludes with hot dogs, doughnuts and coffee or cider served by Paul Bunyan’s cooks. Then the crowd serenades Craig Hall with much volume, even though harmony be a little lacking, and the evening is over.

The activities staged by the Club during the school year are many and varied. Soon after the beginning of school a picnic is held up one of the nearby creeks so as to get the new members acquainted with the Club. We have a campfire supper which is followed by songs and stories until late into the evening. The state of the moon is always considered in planning this picnic.

The Club also enters a float in the University May Day parade and furnishes an act for the Varsity Vodvil show given each year in a downtown theatre for the benefit of the Associated Students.

A banquet is held by the Club late in May, just before the end of school, as a final get-together and as a farewell to the graduating class. At this banquet a number of Forest Service men who have given lectures at the school are usually our guests. Speeches and songs by the quartette enliven the meal until finally “College Chums” is sung and the Forest Club officially ceases to function until the following Fall.

Under the new Constitution, officers are not elected in the Spring for the coming school year. This rule first went into effect in 1921 when the officers for 1922 were elected at a special campfire meeting at Spring Camp. These men were:

- President—Charlie Joy.
- Vice president—Ed. Madsen.
- Secretary—Byron (Pike) Thomas.
- Treasurer—Alvin Olson.

THE FORESTERS’ BALL

The annual Foresters’ Ball, given by the Forestry Club, was held the evening of February 17th as a fitting climax to the Charter Day exercises of the University. The gym was no longer roomy enough to hold the crowd so this year we transferred our activities to the more spacious Union Hall.

Everyone was there; cowboys in chaps and Stetsons, prospectors hidden behind a dense growth of whiskers, lumberjacks in stag shirts and Malones, Indians in blankets and moccasions, a mounted po-
The fun began at 9 o'clock and lasted until 1, when the orchestra was plumb played out. Everyone danced from No. 1 — "On with the Dance" to No. 16 — universal airs and a clog dance and juggling between whirls the quartette rendered pop-

"Adios"; and everyone wanted more. Be-

played out. Everyone danced from  No. 1 until 1, when the orchestra was plumb

being served in relays so as not to rush "ehowed" in Paul Bunyan's mess hall,

show were presented. The bunch spised sheepherder, every character that

tinhorn gamblers, even down to the de-

ing red or buckskin, confidence men and

lice in scarlet and black, hunters in flam-

ng red or backskin, confidence men and

tinohandlers, even down to the de-

spised shepherd, every character that

wished the quartette rendered popular

airs and a clog dance and juggling show were presented. The bunch "chowed" in Paul Bunyan's mess hall, being served in relays so as not to rush the cook. The eats were the old standby to the scene. For a week before the big event a crew had been at work cutting boughs in the nearby hills and hauling them into the hall with a team and bob-

sled. Here another delegation took them over and distributed them around the hall, transforming it into a regular forest. By means of some clever art work on canvas illuminated from behind a most beautiful moonlight and mountain effect was obtained. The orchestra pit was transformed into a log cabin, where axes, peavies, packsaddles and such implements of war formed the mural decorations. The entrance to the hall was obtained through a counting cor-

tral where two rangers relieved the men of their tickets and inspected every man's footwear for calks or hobnails.

The universal comment on the campus is that this was the best dance ever put on by any organization of the Uni-

versity. Certainly much credit is due the men who planned and directed the work.

THE TRIANGULAR MEET

The triangular field meet was held the evening of March 15 in the gymnasium. The fun started with a basketball game between the regulars on one side and the vocations and rangers on the other. It was an eminently successful game. Four men were crippled up permanently and all the rest received minor injuries. When the smoke of battle cleared away it was decided that as the regulars had 14 scalps to their opponents' 4, they should be awarded the honors.

Then Herb Schwan, who was master of ceremonies, got up to announce the next event. He was greeted with a tremen-

dous ovation, blushed prettily, and sat down, after bowing to all parts of the room. A hobble race was put on be-

between Pike Boehm and Kalkhoven, in which Pike showed a form that would arouse the envy of a kangaroo, but Kal's broad-jumping was a little too much for him.

Suddenly the crowd discovered that Nickolaus, Reddington and Slaughter were engaged in a quiet game of craps in one corner. Sam Swartz of the District Office was all interest and wanted to "keep score," throwing down a street car slug to show he was in the game. Nick made six successive passes on lucky sev-

en, but could not beat Reddington's elev-

dens, so that event went to the rangers. Feeling was running pretty high by now, so the vocational quartets, Gates, Myers, Riley and Ennis, gave a few airs to soothe the savage breasts of the con-


tenders.

Then came the logsawing contest and the packing contest; judged by Swarts, Klobucher and Beatty from the District office. In the logsawing the Cramers proved to the crowd the value of teamwork, ripping through the two-foot log in 35 seconds, smoothly and accurately. Then Klobucher illustrated a perfect pack by throwing the diamond on Kalkhoven, but the modern Houdini wriggled out of the 20-foot lash rope in a little better than three minutes.

The rangers took the cracker eating and rope climbing contests, but were set back by the regulars in the tug of war. It was getting late and the crowd was hungry, even the cracker eaters, so the judges were asked for a decision. They looked at the threatening mob of rangers on one hand, and the racing army of regulars on the other, and wisely de-


cided it was a tie, 36:36 between regu-

lars and rangers for first with the voca-

tions second with 6 points.

The crowd adjourned to the shack for coffee and rolls, and filled up in good style; then went home in an orderly manner.

A number of the District Office men were the guests of the Club at the meet. We were mighty glad to see them there, and hope they may come again to all Forest Club doings. We are also grateful to the judges for their co-operation, and feel that the success of the meet was largely due to their impartial and effi-

cient officiating. The events were as follows

Basketball game—Regulars 14; Rang-

ers and Vocs. 4.

Hobble race—Kalkhoven, Ranger, 1st;

Boehm, Regular, 2nd.

Crap shooting—Redding, Ranger, 1st;

Nickolaus, 2nd; Slaughter 3rd.

Logsawing—A. J. and J. Cramer, Reg-

ulars, 1st; 35 sec. Reddington and Olson, Rangers, 2nd; Slaughter and Best, 3rd.

Packing—Cottam and Herschler, R.; Hoyt and Cramer, G.; Slaughter and Col-

vill, Y.

Cracker Eating — Herschler, R., 1st;

Hutchinson, G., 2nd.

Rope Climbing — Kalkhoven, R., 1st;

Waldo, G., 2nd.

Tug-of-War—Six men to a side. Won

by the regulars.

THE FOREST SCHOOL RIFLE CLUB

The Forest School Rifle Club was or-

ganized two years ago, and has steadily gone ahead in numbers and excellence. At present the membership is over fifty, including most of the faculty.

The club is affiliated with the National Rifle Association, through which rifles and ammunition are purchased at a great saving in cost. The initial consignment of Springfield .22 Winchester muskets, ammunition and targets was received last spring.

Standard army equipment has been in-

stalled on the 1000-yard range at Fort Missoula, which the club has the privi-

lege of using. During the winter indoor practice is held every Sunday with the 22's in the R. O. T. C. armory in Cook hall.

Meets are held with the Missoula Rifle Club, the R. O. T. C. and other or-

ganizations and so far the club has been very successful in all competitions.

THE FOREST SCHOOL RIFLE CLUB

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THE FOREST SCHOOL RIFLE CLUB
Field Equipment and Supplies for Firemen and Forest Officers

By Howard R. Flint, Forest Examiner District One, United States Forest Service

I am in favor of setting up standards of equipment and supplies which will be carried by firemen and officers of protective organizations, but I do not favor trying to make these standards too rigid over a large region. Conditions vary too widely, and extremes of standardization are apt to be inimical to the origin and development of new ideas and to progress. If the doctrine that there is but one best way to do a thing is universally and literally accepted, progress along that line must cease. Had Morse and his followers accepted the then standard of the telegraph, the telegraph would have remained a thing of the past.

Morse had available to him a line established "for the organization, purchased in quantities, and if the matter is left to their choice, the men often go poorly rationed.

The following emergency ration is convenient, adequate and economical, and has been tested in use. Options are permissible, but should be decided upon before orders are placed.

Standard Fireman's Emergency Ration

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
<th>Amount Day</th>
<th>Amount Day</th>
<th>Amount Day</th>
<th>Cost 3-day Ration 1921</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacon</td>
<td>3 tins</td>
<td>9 oz.</td>
<td>9 oz.</td>
<td>9 oz.</td>
<td>.50</td>
</tr>
<tr>
<td>Salmon</td>
<td>1 can</td>
<td>8 oz.</td>
<td>4 oz.</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>Kraft Cheese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.10</td>
</tr>
<tr>
<td>Veal or Roast Beef</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.10</td>
</tr>
<tr>
<td>Pork &amp; Beans</td>
<td>1 can</td>
<td>11 oz.</td>
<td>11 oz.</td>
<td>.55</td>
<td></td>
</tr>
<tr>
<td>Sweet Chocolate</td>
<td>3 small bars</td>
<td>2 2/3 oz.</td>
<td>2 2/3 oz.</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>Veal Cribs</td>
<td></td>
<td>12 oz.</td>
<td>12 oz.</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>Hardtack</td>
<td>3 small pkgs. 8 oz.</td>
<td>8 oz.</td>
<td>8 oz.</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>Rice or Dehydrated</td>
<td>cloth sack</td>
<td>8 oz.</td>
<td>8 oz.</td>
<td>.63</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.47</td>
</tr>
<tr>
<td>Sugar (coke)</td>
<td>box</td>
<td>4 oz.</td>
<td>4 oz.</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Coffee, G. Washington</td>
<td>Sufficient</td>
<td>3 oz.</td>
<td>3 oz.</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>Milk, small can</td>
<td>Sufficient</td>
<td>3 oz.</td>
<td>3 oz.</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>Salt</td>
<td>Small wood box</td>
<td>1 oz.</td>
<td>1 oz.</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Raisins, Seedless</td>
<td>Small cloth sack</td>
<td>5 oz.</td>
<td>5 oz.</td>
<td>.08</td>
<td></td>
</tr>
</tbody>
</table>

**Total** 8.13

The rations listed should be placed in compact form in the quantities indicated, in three cloth bags each about 16% by 16 inches. One, two or three packages may then be carried according to whether one, two or three days' rations are needed.

The standard ration should be chosen for the organization, purchased in quantity, assembled in a central warehouse, one lot in early spring and another immediately after July 1. Supervisors of Fire Wardens should decide for their units whether it is advisable for men to carry one, two, or three days' ration before placing their orders, and orders should be placed by them well in advance of need to permit of advantageous purchase and assembling.

It will be noted that all items are non-perishable—therefore, can be safely kept without elaborate storage facilities. Cloth bags are used to prevent leakage and waste. Each ration is done up separately to prevent waste, insure clean supplies, and facilitate packing. The large sacks are sewed with a flour sack as a measure against the premature removal of delicacies.

(Continued on Page Thirty-three.)
FORESTRY KAIMIN

Solving Detection Problems in the Winter
By T. C. Spaulding

The fire season is here again. How many of us have used our heads and saved heels and good horseflesh by the solution of a few of our most pressing problems while the snows were whirling around the station, and some of us were hard put to scare up enough "contributed time" to justify our Form 26 report? The knowledge that the fire game is nine months preparation and three months practice has been proven by pounding and hounding and expensive experience if we have our past has been largely due to a lack of systematic preparation and constructive use of the dead time between blazes. We sit and think and then sit some more. Spring comes on. We have a few ideas, and a plan or so to try out. Maybe the ideas prove to be flivvers and the plan isn't workable, attractive as it seemed when the fire was only in the stove. We had the mental exercise anyway. Possibly we wore out a pair of boots and the "Super's" patience in proving that we were right and he was wrong or he was right and we were wrong, which ever way it went. We have all been there. There isn't much satisfaction either way. In any event it takes us a year or so to get a sound idea at work, what with the troubles at its birth and the trials and tribulations of the fateful first summer.

We are all familiar with the three great divisions in the fire game, Prevention, Detection and Suppression. Suppression, i.e., the getting to fires and putting them under control, we have well in hand. That is a practical question of labor, material and executive ability on the fire itself. Prevention and Detection have lagged behind, far behind suppression. We have barely stirred the surface of public education as a means of preventing man-caused fires. Deep ploughing and that for years is necessary if we have our public in the mental attitude of the European at home. As for cleaning the forest of its inflammable debris maybe S-22 and S-26 have accomplished something. The Public Relations men and the wide awake Rangers have started educational campaigns wisely planned and well managed. That results are being obtained is apparent to all. Sometime we may be able to beat the fires to the inflammable areas, as the European Forester has done, and clean up the worst messes. Congress and the purse control that factor. Detection, the weak spot, is sadly in the rear of even Prevention.

Now we know Detection means the finding and reporting of fires. What else does it mean to us? We talk of two hour control, of five hour control, of tool caches and of emergency crews. We build telephone lines and open up trails. What for? To keep from getting lonesome! Or to increase the "Dude" crop! Hardly! To report fires when they start and to get to them before they get to us. That's the job of the lookout man and the "smoke chaser." I never did like that stylish "fireman" word. Do you? Part Detection and part Suppression. Yes but it's the Detection man that started the ball a rolling. If you have him next time when it's just a bit too cold through three mountain ranges and a Pittsburgh haze, he will handle the "hot" reports as fast as a tree line and the Ranger's wife can get them. (Some Rangers have Administrative Guards. I never was that lucky.) Have you placed him right? Does he really see all you think he can? How do you know? Beg, borrow or steal some U. S. G. S. contour maps of your district, some cross section paper, a protractor, and quite a few hours of contributed time some week next winter when it's just a bit too cold. Can you scale that timber? Then find out. You will find out something else, too, and that is the highest peaks and ridges are rarely the best lookout points or patrol routes.

Take the contour map and fasten it to the table top or a drawing board if you have one. Use thumb tacks or plain tacks, it makes no difference. I assume the contour map to be as accurate as the scale of the map will permit. Most of the U. S. G. S. and Forest Service reconnaissance maps are satisfactory. Cut off several strips of the cross section paper three inches to 5 inches wide and 12 to 14 inches long. Find the lookout station or peak on the map. Stick a sharp pointed needle or pin in the map as near the vertical line touching the station out station pin. Fasten the strip to the map with thumbtacks. This keeps it in place for the plotting.

Now to start with locate any other point on the map you wish to analyze. If your lookout man told you he couldn't see a certain fire from the station and you knew visibility factors were right and didn't have time to climb up to the station to check his veracity, locate the origin of that fire on the map as correctly as possible. Draw a fine line on the map with your hard pencil (6 H preferably) from the station point to the fire point. Have you obtained it on requisition, which will interfere with your profile otherwise. Take a xylonite triangle (you either have one or can get it on requisition) place one edge at the point on the profile representing lookout station, swing it until the same edge touches the top of the highest ridge on the profile (Continued on Page Thirty-six.)
Practical training during the summer quarter is the big connecting link between school training and actual professional forestry. It is a vital factor in the student's training, for it is the only means of teaching those things which cannot be taught in the class room—the things which only actual experience on the fire line, days of hard riding with reconnaissance crew, tutelage at the hands of an expert packer, or endless miles of survey work can teach.

Every summer practically all Foresters at the University put in from three to six months time with the Forest Service or with private concerns engaged in lumbering or similar lines of work. Montana Forestry students are employed in every district in the west. This summer work is considered as part of the forestry training, as it rightly should be, and credit is given accordingly.

The man who is planning on making the lumbering end of Forestry his life work usually looks to Districts 1 and 6 for employment, while the prospective grazer turns to the cattle and sheep country in the Southwest—Districts 2, 3 and 4. Then again, very often a man with experience in the grazing forests will work on the timber forests during vacation time, or the smokechaser and lumberjack will count sheep and grub loco in the South just to get the full perspective of the great game of Forestry.

Two of the men were in charge of ranger districts. McDonald returned to his old district on the Wasatch in Utah. His work was mostly grazing but he found time to take some splendid pictures of that country which would almost persuade us that Utah was a desirable place.

Yochelson was in charge of the Stevensville district of the Bitter Root forest and became locally famous for the clouds of dust he left behind on his way to fires on a broken down motorcycle. He also found time to organize a troop of Boy Scouts in Stevensville and to instill some conservation ideas into the minds of the boys.

Hoyt spent the summer in grazing reconnaissance on the Lolo. The work must have been rather lonesome for he finished the season by marrying Miss Ruth Miller, a sophomore in the University.

Hutchinson also spent some time on range appraisal work on the Lolo; and then went to the Boy Scout camp at Seely Lake as expert in woodcraft.

Cramer and Olsen spent the summer on the Selway Forest in Idaho. Cramer was on protective and improvement work. When the time came to return to school Cramer saved his railroad fare by walking over the Bitter Root range and coming out by Hamilton. Olsen spent his time on timber reconnaissance work.

Charley Joy went back to his old job at the Spotted Bear Ranger Station on the Flathead, where he was headquarters man and assistant ranger.

Ted Shull, Jack Marsh and Ted Meford were all members of the protective force on the Lolo.

The Nez Perce profited by the help of Pike Thomas, Jersey England, and Charley Nickolaus, who were all members of the protective force.

George Daily started the season on land classification work on the Kootenai, but was afterwards transferred to the Lolo as scaler on the Quartz District.

Ralph Crowell held down the Gold Peak lookout on the Missoula Forest.

Les Colvill ran compass for the A. C. M. cruising party all over Western Montana.

Quite a number of the men saw service in California. Madsen and Fry fought rattlesnakes and fires and wrangled dudes on the California and Shasta Forests. Fred Kenline was assistant ranger under our old friend Barney on the Klamath. Craig was stationed on the Sequoia as lookout while Paulson guarded on the Klamath. He claims to have come within five feet of the biggest cinnamon bear in the United States, but cannot give dimensions as he didn't like the look in the bear's eye. Sandvig left early in May for the Ochoco in Oregon where he did protective work. The Sun River country on the Lewis and Clark was the scene of Slaughter's exploits in grazing and game protective work.

Wano Thorpe was again out with the District 1 planting reconnaissance crew. This makes Wano's third season as a contour hound.

Uhlhorn was out with a district survey (Continued on Page Thirty-six.)
The part of the curriculum which is looked forward to with the greatest interest and remembered longest after school days are over is the Spring Camp. Along about the first warm days in May the whole school rolls up its individual bed roll, greases up the old Jeffersons and breaks out the new Filson in preparation for the big event.

The camp site has not always been the same. It has been at Salmon and Seeley Lakes, but has now been for the last two years at the University Biological Station on Flathead Lake. But it is always in the heart of the forest where the men can get the practical experience so necessary in the education of a forester. The camp is run on a regular schedule and everything goes as smoothly as when in the shack behind the hedge.

The work is thoroughly practical and very many sided. Trips are made to all sawmills, logging camps and other centers of wood-using industries nearby. When at Flathead lake we all visited the big mill of the Somers Lumber Company at the head of the lake. Here the men checked up on utilization, studied costs and methods, and became thoroughly familiar with the workings of a big plant. Then we inspected the Great Northern Railway tie-treating plant near the mill and saw the green ties run into the huge cylinders by the carload for treatment with zinc chloride so as to prolong their life. Other points of interest were the power plant at Big Fork on the Swan River, and the fish hatchery at Somers.

Besides these trips far afield, which can be reached only by boat, daily classes are held in most of the regular courses of the school, such as surveying, cruising, mensuration, silviculture and management. The eighty acres owned by the University at Biological Station is being gradually thinned, cleaned and put under regular forest management by men in the silviculture and management classes.

Peg's men lay out railroads and trails, build bridges, and shoot the stars. Tom takes the grazing men over to Wild Horse Island where they can't sneak back to camp on him, and smokes a quiet pipe on the summit while the class sweats and fights flies down below. The freshmen spend many ecstatic moments getting specimens for the botany prof, while the R. O. T. C. men under command of Lt. Col. Thomas maneuver on the beach after supper.

But Spring Camp is not all work. We have one day to ourselves during the ten-day period and we stage some great log-rolling contests and other events. Last year Hutchinson, Schwan and Closs hiked to the summit of the Mission range. They report the sight of Swan lake and the mountains of Glacier Park.

The long evenings after supper are the best part of the whole camp. There is a perennial horseshoe tournament going on every evening. At present Tom and Peg hold the championship belt, and are willing to meet all comers. The quartette favors us with selections from the stern of the Helena as she lies at the beach. The rowboats are very popular with the fishermen and amateur mariners, while the gentlemen of sporting instincts gather at secluded spots and essay their fortune with the ivory cubes.

Artillery practice is a favorite with most men and a range is about the first improvement constructed at the camp. Time was in the good old days that when common target shooting palled, the aspirants for fame would toss up eggs and kill them on the wing, but in these times of high prices such practices cannot be tolerated. The innocent Johnny-comelately is here initiated into the Forestry Club, and snipe hunts, observing Polaris through a coatsleeve, and other famous old gags prove each year that Barnum was right.

At the end of ten days the bunch breaks camp and pulls for home, feeling hard as nails on Phil's good grub and the outdoor life. And the remaining few weeks of school sure do pass slowly for each one has got the call of the hills into his system and is anxious to get out on his summer job of good hard work in a good game—that of practical forestry.
Logging Engineering as a Profession

By J. H. Ramskill

Just what and how extensive is the field of the logging engineer, and what has it to offer those making it a life work? This and similar queries concerning this comparatively new profession are often heard. An answer must either presuppose a fair knowledge of the history of the lumbering industry, or must go into development somewhat that the conditions which have produced the logging engineer may be understood and appreciated.

In the pioneer days of the country the value of the land for its food producing qualities was the first consideration, and the standing timber was considered as a by-product. Beyond the meager requirements for housing and fuel, it had no commercial value. That condition still prevails in a few isolated localities. Elsewhere it has changed to such an extent that the value of timber land is found in the standing timber rather than in the land itself. This change in timber values and the ever-increasing demand for lumber has caused the disappearance of all the most accessible forests of the country, so that the lumberman and logger have been moving back by successive stages, and are now working the more inaccessible timber bodies. The costs of production have thereby gradually increased, until they are today greater than ever before. But the selling price of lumber has been affected by these increased costs only to a limited extent, being based almost wholly on competitive conditions. This development has reached such a point that today the margin between profit and loss in the lumbering business is smaller than ever before.

The fundamental problem of every industry is the same; namely, to secure the greatest production at the lowest cost. No business which does not achieve a satisfactory solution of this problem within its own field can long operate with financial success in these days of intense competition. One of the interesting developments in this struggle, during the last few generations, has been the increasing recognition of the engineering professions by industry. A famous engineer once said that the object of all engineering is to make a dollar earn the most interest. So long as the rough and ready and rule of thumb methods, which prevailed in all industries during their early days, returned a satisfactory rate of interest on the capital invested, they were "sufficient for all practical purposes." But when operating conditions became more difficult, and competition, that regulator of industry, began to make itself felt, these older methods began gradually to go into the discard, to be replaced by the more exact theories of science.

One of the last industries to look to engineering for help in its struggle for existence is lumbering, more particularly that branch called "logging," and the Logging Engineer is one of the latest recruits to the ranks of the engineering fraternity. His first appearance about ten years ago caused little but adverse comment among lumbermen, who were inclined to scoff at him as an impractical theorist. But the last decade has seen a complete change of front on the part of all progressive operators, who are as emphatic today in their endorsement of the logging engineer as they had previously been inclined to condemn him. In other words he has made good. In doing this he has but proved again the ability of the engineer to solve industrial problems. Until the last few years his operations has been principally confined to those regions where logging is the most difficult and where the capital required for successful operation is large. These conditions obtain to a larger degree in the great Pacific Northwest than in any of the other timbered regions of our country, and it is here that the recognition and success of the logging engineer has been greatest. But today his activities are by no means confined to this region. He is rapidly becoming an important factor in the lumbering industry in other regions, not only of our own country, but of the world. Canada, South America, India, the Philippines, Siberia and Africa are now competing for his services. And this demand from abroad for American logging engineers will increase as time goes on. While the United States today produces more than one-half of the entire lumber cut of the world, not more than five per cent of it figures in our export trade. And the amount available for export cannot help but decrease from year to year, as our domestic needs increase and the supply of standing timber decreases. In other words, as every forester will corroborate, the time is not far distant when the trade balance of our country, so far as lumber is concerned, will be against us. This economic change will force the development of the timber resources of other countries. And on the frontier of this development will be found the Logging Engineer, since it will be upon his advice that capital will rely before venturing into such new enterprises.

In the pioneer days of the profession the Logging Engineer received his training in the school of practical experience. This was grafted on many cases on a previous college training in civil engineering. This combination produced the leaders in the profession in those days. But some of the knowledge possessed by the civil engineer was found to be superfluous and some of it inadequate, and few of the engineering schools understood or sympathized with the development and needs of the lumbering industry, sufficiently to alter or add to their curricula the special work needed by the Logging Engineer. However, there existed then, and have grown up since, another type of school that is much better fitted to assume this task. These are the forest schools of the country. Here the lumberman found understanding and an appreciation of his problems and difficulties. For a forester must understand the business of lumbering, since it is the operation by which the crop is produced and protected is harvested. And so there has gradually developed in these schools a curriculum suited to the needs of the Logging Engineer. In this development it has been found that the best results are obtainable through a combination of class-room and field work, the latter to extend not only throughout the vacation periods but partly into the school year as well. In this way the student has an opportunity to see the principles elaborated in the class-room put into practice and gains a truer perspective of the work. But the most important thing he learns and the one that counts the most in his ultimate success is that logging superintendents and consulting logging engineers are developed through practical experience and cannot be turned out full fledged by any school. A certain amount of apprenticeship inundefined positions is as necessary in this profession as in any other to enable the young graduate to absorb those practical details which cannot be acquired except through service. But with his University training as a background these are mastered and assimilated far more rapidly than could otherwise be done, and he is enabled to round out his education in his chosen profession with the least amount of lost time.

A GOOD TIME TO OVERHAUL OLD PAINT BRUSHES

"When treating posts with creosote, if paint brushes have been laid away with paint in the bristles and have become hard, hang them in the tank so that the bristles are immersed in the hot creosote. The creosote will eat the paint away and make the brush serviceable again."—E. L. Mills, Forest Ranger, Gunnison National Forest.
Aerial Forest Fire Patrol

A. Price Townsend, Deputy Supervisor, Missoula National Forest

Much has been said and written concerning the advantages and disadvantages of aerial fire patrol of the timber resources of the United States, and particularly of the National Forests of District One, Five and Six of the Forest Service.

About a year ago (January, 1921) the writer was detailed to Mather Aviation Field, near Sacramento, Calif., to attend a conference of Army and Forest Service officials with a view to working out a liaison between the two branches of the government, and to arrange a program of aerial patrol for District One. Incidentally, I obtained expert training from Army aviators as an observer, which included photography, mapping, location of "dummy" fires, together with a very comprehensive course in wireless telegraphy and a smattering of wireless telephony—the present day means of communication between the air and ground forces.

The purpose of this article is to outline the advantages and disadvantages of aerial patrol, and leave it to the reader to decide whether or not it should supplement our present lookout system of detection, although adding to the cost of that system.

To those who live in the settled parts of the country, the matter of forest fire protection is largely suppression. A fire of slight consequence can hardly be started before someone sees it and reports it to the one who is responsible for its suppression. Here detection is not an important matter; it is taken care of automatically through co-operation.

In the large forested regions, however, there is a vast difference. The means of transportation and communication are few. The character of the country is usually mountainous, wooded and difficult for the casual passerby to see the surrounding region. Under these conditions it is plain that the detection of fires should not be left to chance. An organization should be established whose sole duty is to find fires and report them as soon as is humanly possible. Herein lies the importance of detection as related to the forest fire problem.

It is obvious that every fire starts in a small way. No large area suddenly flares up in flames at once. The fire starts from one of any number of causes in one place, from which it spreads according to conditions, gradually gaining volume, and covering an increasingly larger area. It naturally follows that the quicker action in the form of efficient work by a crew of fire fighters is brought to bear upon a fire, the greater will be the opportunities for its quick suppression at a minimum of expense and damage.

The forest protective agencies of the west have realized for a long time the importance of prompt detection; consequently they have expended much effort in establishing a system of lookouts on high and commanding peaks, whose sole duty consists in watching the surrounding country for the tiny wisps of smoke denoting the forest fire in embryo.

In 1919 a new adjunct was added to this detection system through the co-operation of the Air Service of the U. S. Army. The airplane furnishes a means of direct vertical view of any fire situation without the distortion of angular view, or without interference from intervening ridges. The airplane is mobile, and can go directly to a fire, circle above it, gathering the information that is desired, determining the exact status of the fire, its location, and character of country and material in which it is burning. During the period of smoke and haze, when the country is completely overcast, the view from the airplane is not so seriously hampered as that of the lookout.

The aerial patrol system has operated throughout the forested regions of Oregon and California, consisting of twelve different routes, varying in length from 200 to 500 miles. These routes were flown from bases selected and maintained by the air service. The reports of fires were transmitted by wireless to the suppressive forces of the U. S. Forest Service.

The famous De Haviland airplanes (4-B type) rebuilt and equipped with 400 horse power Liberty motors, were used throughout the 1920 season. Their performance, under the hard usage of long and difficult patrolling was nothing less than marvelous, making a record in Oregon of 150,000 miles with but three forced landings, which resulted in no serious injuries. Each ship assigned to patrol was equipped with a radio sending set, consisting of a small, wind-driven generator attached to the landing gear, with the sending keys and attachments in the fuselage. The antennas, a specially constructed wire of some 250 feet in length, was dragged behind the ship in flight. At the bases, and in some instances at other strategic points, ground receiving stations were established, and equipped with the small, compact but highly efficient Signal Corps radio set, No. 59.

The receiving stations were so located that when a ship on patrol passed from the receiving radius of one station, it entered the radius of another; thus being in constant touch with one base. By this means; all new fires discovered, as well as the status of old fires, could be reported immediately.

The radio performance, when considered throughout the course of the 1920 season, was fairly good. There was some trouble experienced during the forepart of the season, but by making adjustments and constantly testing the equipment, these troubles were largely eliminated.

The patrol routes were so organized as to cover as much of the timbered sections of the region as possible. At first definite routes were laid out and the patrol required to fly them. It was found, however, that more accurate results could be obtained by the ships going directly to each fire; consequently strict adherence to a prescribed route could not be maintained.

Each ship on patrol carried two men; a pilot and an observer. The former attended to all of the flying duties; the latter confined all his energies to finding and reporting fires. Flying soon became an old story, and the fun of flying soon took on the color of steady work. Competition in attempting to secure first discoveries of fires reported developed rapidly, and served to keep everybody keyed up to the situation at all times.

The chief advantages of the aerial patrol, as previously pointed out, consists of direct vertical vision, mobility, ability to cover a large area in a short time at a small cost per acre; ability to see through a smoke blanket with more ease than a stationary man, and the ability in obtaining an adequate idea of the fire situation as it concerns large districts. There is an added advantage in the fact that a quick reconnaissance of a large fire can be made, obtaining valuable information as to the activity of the fire on all sides. This was found to be of great assistance in directing the fire fighting crews in their suppression work.

The fighting of the large forest fires of the Northwest is seriously hampered by "spot fires," caused by wind-carried sparks some distance in advance of the main conflagration.

Lookouts, owing to a fixed position and long, horizontal or oblique views, often through a heavy screen of smoke or haze, have but limited success; in this phase of detection. The airplane can go to and hover over the "spot fires," and by looking down vertically with the light rays, can see more clearly through the smoke and haze, and render a better and more complete report of the situation.

The disadvantages of the airplane from a detection standpoint, consist mainly in the fact that it passes over a given area but once or twice a day, while the look-out is always on the job, taking his

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WHEN asked to talk at this meeting I was in a quandary. There are so many subjects on which your instructors and my associates are so eminently more qualified to speak than I that my field is narrowed. Yet that very narrowing serves a purpose. Considering my limitations, my thoughts naturally reverted to what made me enter the Forest Service in the first place; and to what, as a correlated thought, would make me enter it today, were I on the threshold of a career as are you men. My own reasons in the past would little interest you, and I am making the reasons of today my topic.

We must first visualize the conservation movement as it stands today. A few years ago the Forest Service was an isolated bureau existing because of the tolerance of the majority of people, not because of their understanding and belief in it. In this stage it was bitterly attacked by a small but influential minority of public men. It won through the crisis, partly through the common sense, the conciliatory attitude, the impartial action, of its administration, but chiefly because the hypothesis of its existence was fundamentally sound.

The American people are big spenders, but likewise big savers. The Americans have little or none of the thrift that is a salient characteristic of the French. But an American nearly always knows to what use he is putting his dollar, and to my mind that is more intelligent economy than hoarding. For a century America exploited its forest resources recklessly. Then came an era where the need of retribution was undeniable. The conquest of the middle west and the west is, in my opinion, evidence the American had spent his forest dollar a bit recklessly, perhaps, but to good advantage. For a short period we went to another extreme—we reserved, both as a nation and as states. Then the common sense of America re-asserted itself. It made the biblical Parable of Talents modern, and expressed through the medium of the Forest Service that conservation means perpetual use, not reservation from use. History will establish, I believe, that the early opposition to Forest Service was due less to opposition to conservation than to doubt as to whether the Forest Service was the proper means of conservation.

This was the formative stage of the Forest Service. For the next few years it was occupied with the tangible problems facing it. The success of these few years can be best stated by citing the fact that the stockmen, originally the bitterest foes of the service, are now its staunchest friends; that the timber men operating on the forest who originally resisted the idea of the government exacting a binding contract at all are now so reconciled that, before entering into an operation, they discuss intelligently each section of the agreement; that the countryside which originally viewed foresters as pensioners now places them high in community life and regards them as leaders rather than obstructors.

The world war lent impetus to the final conception of the Forest Service. The period of rigid economy where possible, of uncontrolled expenditure where necessity justified it—this era brought our nation to acute realization of the value of raw materials. Before that time conservation as applied to private enterprise was received with skepticism, charitably speaking. Suddenly we hear nation-wide talk of woodlots, state forestry from an obligatory rather than optional standpoint, and the extension of tried forestry practice among the holdings of large private corporations.

In other words, gentlemen, we have at last come to, or rather crossed, the Rubicon. A few years ago we sagely debated the immediate necessity of conservation. Today we tacitly accept it as a proved necessity and confine ourselves to discussion of means, rather than of the end.

The greatest national asset of the United States is the adaptability of its people to any given set of conditions. There is no evasion of issues. We have before us the issues of Forestry. It has many ramifications. There is the Forest Service itself, controlling national forestry; State forestry; forestry among large private holders to the degree compatible with paying business; forestry among small private owners and the farmers. But after all, the greatest barrier to conservation has been passed. As I say, the relation of the private owner to the welfare of the state is no longer in debate—it is a question now of means rather than the end. There are bills before Congress now, and will be, reaching out after the proper means. I need not discuss them here, as they are not pertinent to my subject. Within a very few years our people have come to realize that privately owned timber, range and water power are as properly within public interest as are railroads, shipping, navigation, industry, etc. In short, the profession of forestry is assured.

Henceforth the Forest Service faces a new role. It must keep its own house in order, improving the execution of its own appointed tasks until the result stands as an example to all the branches and organizations of forestry. But more than that, it must assume leadership in the universal application of forestry principles. The application will vary, but in every step towards perfection the Forest Service will have to be the guide. We all know the part the Department of Agriculture plays in farming; to a less degree are we familiar with the part different government agencies play in setting standards for certain raw and refined materials. A similar duty confronts the service. With its great resources it is in position to determine more readily than other agencies what constitutes the best practice, both from the viewpoint of desirability and that of practicability. The application of the principles of forestry on private holdings depends primarily on their practicability from a financial standpoint, and it is the Forest Service which must demonstrate that practicability in every advance it sponsors.

It may be asked what is it that will enable the Forest Service to carry out all this? The same old answer, personnel of the highest quality. Last summer I asked three rangers of widely different types what was the biggest factor in successful fire protection. Without hesitation each answered, good personnel. I have always held that the quality and quantity of work is in direct ratio to the quality of personnel—other factors are mainly side issues.

You men of the University of Montana will be one of the sources of supply that the Forest Service and the profession of forestry in this region will depend upon. Personally I believe that by far the greatest per cent of foresters will go through the mill of the Forest Service. A certain per cent will stay in it, training the new comers, but a bigger per cent will pass on into state and private forestry. No sane man who realizes the scope of the mission of the Forest Service will do aught but rejoice at such a probability.

In this belief that most of you will at one time or another be in the Service if you make good here at school and simultaneously in your field training, I am going to try to sketch what the Service demands of a man, and in so doing I will not pass by any of the demands made by the profession at large.

In the first place, realize one thing. There are two kinds of professions in the world: the individualistic, more or less secluded kind, where one reaps just what he has sown—in this class belong lawyers, doctors, industrial experts, etc., the second is the class where the individual is submerged in public or semi-public
service — we have the engineer, the teacher, and, to be brief, the forester. When you enter the Forest Service I want you to realize you are on the teacher, and, to be brief, the forester. We have the engineer, the forester — we have the engineer, the forester. Mary. When you take up the burden of your outlook is concerned, to the Sons of Martha— -you know the poem The Sons of Martha seldom bother, for they know in them is the grace confessed, blessed! That thought is going to make "And the Sons of Mary smile and are those who have cast their burden upon the Lord, and the Lord He lays it on Martha's Sons.

Men, consider well that last stanza. "And the Sons of Mary smile and are blessed!" That thought is going to make you curse sometimes when your finest achievement is received with maddening complacency by the public you benefit. A few of you will enter straightway from this college the more prosaic restrictions of private employ, but the most of you will emerge from the crucible of the Forest Service. Even in forestry outside the Service, where your duties are pretty well defined, you will find an irritating non-comprehension of your task, its how and why. But in the Service as you pass from one to another of a strange complexity of tasks, you will be daily afflicted by this ignorance of the public concerning your motive, your job, your joys and your sorrows. Even the people closest to you in the world can at best admire only—they can only appreciate the YOU that is bound up in this. Honesty of purpose implies most of all the ability to say no, both to one's self and to others.

The third is physical fitness. In the woods this implies a certain mental trait. Brawn can never supplant courage when you are up against it in the hills. I have seen many an athlete fall by the wayside. But do not imagine you are being worse treated than you would in any profession. Your summer seasons as guards give you only a taste of it. A Service man. They can tell you what it means to be out in the sticks month after month. But do not imagine you are being worse treated than you would in any profession. Your summer seasons as guards give you only a taste of it. A Service man. They can tell you what it means to be out in the sticks month after month; to drag a tape through Idaho brush when the black flies are fooling around your eyelids and the mosquitoes are working industriously on the back of your neck; what it means to be the drudge that has to do every tiresome statistical job about the office; to get shot hither and yon as a hardboiled Supervisor fancies. This is only a glimpse of what you must buck when you assume a yearlong job.

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THE ENGINEER'S PRAYER

O, Lord grant that as I make this survey called Life, I may find pleasant camping places, that the cool waters of congenial companionship may flow past my tent door, that the woods of hardship wherein we must all walk, be not too heavily clad with the underbrush of hard luck, that the nettle called remorse grows not too abundantly there, that there be a spring of friendship and shade trees of rest wherewith to refresh myself; that the cooling breeze may blow sometimes across my forehead and drive away the remembrance of wrong deeds done and righteous deeds undone, that as I lay out the curves of my life there may be a downgrade from thine will to mine, and that the super-elevations may be correct, so that as I swing around the curves I may not leave the track that leads to thy Kingdom.

Lord, grant that when the most of my life is computed, it may not exceed thine original estimate, and, Lord, when I take an observation to obtain a true bearing grant that my instrument be in perfect adjustment, so that I shall not deviate even so much as one second the sight which thou has set at the end of the long tangent which leads through the Portals of Gold into the Passenger Depot where thou are Yard Master. I pray that when my road is built there shall be no dangerous rocks or trees left above the cuts to endanger the safety of travellers over this route.

Lord, in thy infinite tenderness and mercy, and love so encompassing that even I am included in thy promise, listen to my prayer and grant that when I turn my notes to the Chief, and sign my last pay roll, he may say, “Well done.” Amen.

HE'S A D-D GOOD MAN TO KNOW

Do you know the man with the square set jaw
And the quiet level eye,
Who rides where the timber meets the snow
And the snow peaks scrape the skies?

Have you met the man from the lookout bleak
Who loyal and eagle-eyed,
Signals the red foe's first advance
And reports the battle's ebb and chance
Till the red glare has waned and died?

Is he your friend—this rider grim
With scanty food and pack,
Risking the canyon's dizzy rim;
Putting his horse through jungle and stream
To meet that first attack?

There in choking smoke and searing heat,
Those first minutes may count as days—
His code has no such word as "quit"
And a fire brooks no delays!

Have you met the man with the marking axe
Who says which tree shall fall,
And stands twist greed and posterity's need
And works for the ultimate good of all?

Have you met the man in his trail-side camp
Neath the spruce tree's friendly roof;
Sharde his freely proffered tobacco or chuck;
Hearde his "Keep to the right! Adios!
Good Luck!"
Had his quiet eyes look into your eyes
And put you to the proof?

Have you met the man in the office chair
Hampered by routine and plan?
Meet him again on mountain trail;
In camp or woods; in smoking vale—
Among men you'll find him a man.

Unquestioning loyalty is his due,
May it ever be as it was of yore,
When his every man was his "right hand man"—
THE RANGER

Up from the sage to the pinon, up from the pinon to pine,
Viewing his mountain dominion from valley to far timber-line,
A lusty young ranger came singing a song to the musical drone
Of his pack-horse bell that was ringing a queer little tune of its own.

Step along you lazy! Hop along you blue!
Don’t you let the evening get ahead of you.
Yonder goes the sunlight sliding down the Pass,
And a mile to make Chilao and water, wood and grass.

It’s coffee, beans and bacon—and then a little smoke,
And some as think that ranging is nothin’ but a joke;
Sweating with a trail crew, powder, pick and drill,
First you get to excavate and then you got to fill.

Lining up your switch-backs, cutting down the grade—
It ain’t exactly loafing and smoking in the shade.
Pulling down a pay-check in the Service means
Raising plenty of blisters and wearing out your jeans.

Mebby so it’s healthy when there’s nothing more
Than working twelve hours out of twenty-four;
Mebby so your sleeping when tingle goes the phone—
Fire has been reported up on San Gorgone.

Fording when the stream’s high, riding in the rain,
Living close to Nature is giving you a pain.
Slippin’ on the round rocks, splashing through the dark.

Wishing you were Noah squatting in his ark.
And you got to sabe packing—of course you got to ride,
You got to be a doctor, you got to be a guide,
Carpenter, surveyor, timber cruiser, cook.
You got to know a whole lot that isn’t in a book.

You got to sabe grazing and how to draw a lease,
And you got to listen both ways and try to keep the peace.
When you ain’t a dousin’ campfires left by city sports,
Your settlin’ in your cabin makin’ out reports.

Oh, it’s great to be a ranger and with the rangers stand,
With sweat upon your forehead, with shovel in your hand,
Mending trails and ditching until your back is broke—
Oh, it’s coffee, beans and bacon—and then a little smoke.

Over the sage and the pinon, over the spruce and the pine,
The mid-summer moon held dominion from valley to far timber-line.
A star on a concha was gleaming—asleep in his rowdy and jeans
A lusty young ranger was dreaming of coffee and bacon and beans.

DISCOVERS SMALLEST SAWMILL

Discovery of what is supposed to be the smallest saw mill in operation in the United States has been made by E. C. Erickson, attached to the local office of the United States Forestry Service.
He found the Prairie City Box Company operating in a remote part of eastern Oregon with a total logging and mill crew of three men, supplemented by one horse. It is understood to be gaining a reasonable income on a total cut of 4,000 feet per day.—Lumber.

A SCHEME FOR UNIFORM INSIGNIA

I am a strong advocate of the Forest Service uniform. I have not yet been converted to the idea of insignia indicating rank and length of service; but having failed to see any definite proposals for the different types of insignia from the advocates of those ornaments, I have ventured to jot down a few rough suggestions for them.

Insignia of Rank: Fire Guard—Streak of lightning (indicating the source of 52 per cent of his troubles and his theoretical speed in getting there).

But here my imagination fails, and I leave it to the insignia advocates to finish this list.

Length of service could undoubtedly be indicated by chevrons, but it is already indicated to the trained eye by many other things, e.g.: First year—Still wears high-heeled boots, leather cuffs and six-shooter. Practices throwing lariat.
Second year—Can tell steer from bull.
Third year—Can flip flapjacks in frying pan.
Fifth year—Marries schoolma’am at cross roads.
Seventh year and on—Seasoned veteran but no sign of overmaturity. Thereafter years of service can be further checked by noting gray hairs on temple, crow’s feet at corners of eyes, and the growing tenderness in old Dobbin’s front feet.—Sage Brush Sam in the Service Bulletin.
A sawyer hot was bawling—Who taught you to file? You surely missed your calling by ten quaters of a mile. Your saws run hot, they snake a lot, the teeth are split, they do not fit. And when those blades begin to rattle I think of some enormous battle. You think you are a filer great but I can say you are a fake. The filer first was much surprised but soon became quite diguiffed and roared in tones that terrorized. You saw up knees instead of trees. You think a log is made of cheese the way that carriage hits the breeze. The carriage riders cling like death and half the time they have no breath. They bow their backs and bend their kness and hang on like demented fleas. You must be full of jackass brandy, a sober man would be more handy. Those saws were made for cutting logs instead of spikes or guides and dogs. If we don't soon a sawyer get this old saw mill will be to let.—The Disston Crucible.

Mark Twain once predicted failure for prohibition because the Germans had invented a process for distilling brandy from sawdust. “What chance for prohibition,” said Mark, “when a man can take a ripsaw and get drunk on a fence rail or drink the legs off the kitchen table?”—Mad Lab.

Did you ever for a summer try a summer try a bachelor's stunt alone In some lonely mountain meadow forty miles away from home; Where the mosquitoes wore no muzzles and the flies knew how to bite And the rattlesnakes were plenty and the coyotes howled at night. Did you ever cook your flapjacks in a house so full of smoke That the tears dropped in your butter. Now it's funny but no joke. Have you burned your beans and bacon, wished devoutly for a wife. If you haven't then you're missing half the joys of Ranger Life.

Have you tried to catch your horses in a meadow wet with dew Where the grass grew long and luscious that wet your clothing through? Did they kick their heels in pleasure and then start on a run Across that same wet meadow till you wished you had a gun? Did you finally corral them in a corner of the fence Stamping, snorting, wildly eager, looking for another chance To dash by you—kick their heels up just as though you were a stranger? If you haven't then you're missing half the joys of a forest ranger.

Have you ridden for an hour beside a roaring brook Watching trout jump in the sunlight and you didn't have a hook? Where the shadows on the water were alluring as a dream Did you mutter a few cuss words as you left that tempting stream? And did you swear by all that's holy that as sure as Sunday came You'd be back there with your fish rod and mix in that little game? Did you roll out Sunday morning half awake and half a-sleep To get this little message “Will you go count Freeman's sheep?” Did you mutter a few cuss words as you left that tempting stream? And did you swear by all that's holy that as sure as Sunday came You'd be back there with your fish rod and mix in that little game? Did you roll out Sunday morning half awake and half a-sleep To get this little message “Will you go count Freeman's sheep?”
SAVENAC JACK

Savenac Jack was a hard man to track
He could chase o'er the hills like a deer
He knew all the creeks away back in the
sticks
Getting lost was the least of his fear.

As a forest patrol, he's a worthy old soul
He aspires to chase after smoke
His echo responded, which caused
him to think
He had company—and now could rejoice.

One day he was sent to the head of a
creek
Away back on the Idaho line
Its duck soup, said Jack as he shoul-
dered his pack
He cut across hills that the trail wound
around
And gained fifty feet at each step.

The heat of the sun bothered Savenac
Jack
For he had climbed over wind falls and
siderock all day
And was still a long way from the peak.
He wandered around through the browse
on a hill
Till he found a fresh track in the soil.
The card's have been stacked, said Sav-
enac Jack,
It's suspicious according to Hoyle.

He followed the track's that were fresh
in the soil
And he yelled to the top of his voice
And his echo responded, which caused
him to think
He had company—and now could rejoice.

He thought all the while that the echo
he heard
Was the voice of the fellow ahead
So he threw off his pack and examined
the tracks
But it won't do to print what he said.

Then he made the brush crack, as he
adjusted his pack
And took a bee-line for home
For Savenac Jack was convinced that
the tracks
He had followed were simply his own.

—W. Godfrey.
Game Conditions in Montana

By Glenn Smith, Assistant District Forester

Montanans have for years boasted of the bountiful supply of game and fish within the bounds of our treasure state. In the past this has been done with good grace and we have made good with the many sportsmen lured to our state by our loud proclamation. And today Montana is known from Maine to Florida and from Boston to San Francisco as the big game state of the Union. Yet I am afraid that we have been so busy advertising our game and fishing resources that we have not had time to consider what has happened in the past five or ten years.

In presenting the following figures on Montana’s stock of game I don’t want to be placed in the light of attempting to scare or stampede anyone; neither do I want anyone to get the idea that I or anyone else has actually counted all the game animals of Montana. In securing this inventory, use was made of the 150 or more forest officers scattered over the state in the seventeen national forests embracing 16,000,000 acres, which located as they are in the mountainous and timbered portion of the state, cover a large majority of the natural game range of the state. These men have an excellent opportunity to observe game conditions and with assistance of settlers, trappers and others, submit the following figures:

- 50,000 deer, 12,000 elk, 1800 moose, 2,000 mountain sheep, 3,500 mountain goats, 175 antelope, 30 caribou.

These figures indicate quite a supply of deer, yet not many years ago Flathead County supported twice this number, and while definite figures are not available, it is safe to say that the supply of deer has been reduced in Montana 70 per cent in the last ten years; the supply of elk at least 50 per cent in the last five years; moose have probably held their own, while mountain sheep and goats have declined at least 50 per cent in the last ten years.

In speaking of the amount of game in Montana, the game within either the Glacier or Yellowstone Parks is not included.

Just for sake of illustration: If these 50,000 deer were equally distributed over Montana, there would be approximately one deer for every three sections of land, or in other words, there would be one deer for approximately every fifteen people.

No place in the written history of Montana has it been possible to find any record of the game resources of our state. Writers and orators of a few years ago referred with pride to our forests full of game and rivers teeming with fish. But those were the good old days when the limit was six deer, and your carrying capacity was the limit on fish. Those are bygone days; days to remember but not to enjoy again; yet we can improve our present condition if we will act immediately and wisely. So much for the large game animals. Now how about the game birds? The lack of blue grouse, ruffed grouse, prairie chickens and sage hens in the real bird country of the state is surprising.

The sage hens and prairie chickens are about extinct. Every one conversant with present conditions will agree that we have but few ducks now compared with years ago. Yet in the past few years the benefits of the federal migratory bird law are very gratifying.

The fish question is also a matter of deep concern to a large number of our people and while our State and Federal Fish Hatcheries have been running full blast and turning an enormous amount of fish fry out each year, yet the fishing in our streams seems to be gradually declining. Do you know that in the past two years there has been placed in the waters of our streams something like 50 to 60 million fry? If one half of these fish lived 15,000 fishermen could catch their limit of 25 pounds a day every week of the year. Are there many who do it? I doubt it very much.

Don’t understand me as criticising the efficiency of our state and government hatcheries, for I am sure they are handled most efficiently.

What is the trouble then? How many know? I am free to admit that I don’t. But I am told by fish culturists that the remedy lies in rearing ponds or nurseries where the little fish can be grown to a size of 4 to 5 inches long before they are liberated in the swift mountain streams. This system has proved very effective in a number of states and in a few cases in our own state.

California, Washington, Oregon, Minnesota, and many other progressive states have found it advisable to place the handling of the state’s game in the hands of a non-partisan commission with wide discretionary authority. This seems especially desirable in Montana in view of the variable conditions around over the state which under the present system is handled by the legislature sitting every two years.

Forest fires destroy fish and game. BE CAREFUL!
Tall Larkspur Eradication in Utah

By D. A. Shoemaker, Grazing Examiner, District 4

The heaviest losses in cattle which occur on the high summer ranges in the National Forests of the Rocky Mountain region are due to poisonous plants. Approximately 90 per cent of these can be attributed to the so-called tall larkspurs. The tall larkspurs all belong to genus Delphinium, the common name being applied to the perennial species that are generally of large size. Delphinium barbeyi (Huth.) is one of the more common species and very well represents this group of plants.

Considering the large amount of losses in cattle from this cause it is evident that some control measure should be adopted to eliminate or at least greatly reduce them. Generally it is on the higher elevations, on the better soils and among types of vegetation which are of high value for cattle grazing that this plant grows in abundance and constitutes the greatest menace. Clearly then it would result in the loss of a large amount of good summer range if cattle were not allowed to graze on the tall larkspur infested ranges.

Recognizing these facts, experiments were conducted in order to arrive at some method whereby these valuable grazing resources could be utilized and at least the greater part of their value realized by the cattlemen. These experiments clearly demonstrated that the plant could be eliminated from the range by grubbing it out and further that on many areas such control would be entirely practicable. The truth of the latter statement is undoubtedly due to the fact that the heavy stands of larkspur are generally confined to deep loam soils which remain moist throughout the season and therefore generally occur in more or less isolated patches of comparatively small size. Oftentimes a few acres of the larkspur occurring in scattered patches are veritable death traps and constitute a severe hazard to a very large area of range so that elimination of the poison on small areas makes safe ones of large size.

Careful work is necessary to secure satisfactory eradication since in order to kill a larkspur plant the tap root has to be taken out to a depth of from seven to ten inches and all lateral roots to a distance of at least four inches from the tap root.

Even with the most careful work it is necessary, if satisfactory results are to be accomplished, to regrub the areas the following year and thus that plants missed or poorly grubbed the first time will be permanently removed. A special tool or mattock having a blade about three and one-fourth inches wide and eleven inches long with a pick about eight inches long on the opposite side has proven most satisfactory. This tool can be made by welding a piece of good steel onto one side of a miner's surface pick, leaving the other side in its original form.

A considerable amount of this eradication work has been done on the National Forest ranges by the Forest Service in cooperation with the interested cattle owners. In the Intermountain District of the Forest Service, including the southern half of Idaho, all of Utah and most of Nevada, during the last five or six years, 1,373% acres have been grubbed at a total cost of $10,792.77 or an average of $7.79 per acre.

One hundred and fifteen applications for the Helena Forest, Breen is Forest Examiner on the Pend d'Oreille; Fitting is Fire Assistant on the Pend d'Oreille; Griffin is a Ranger on the Beaverhead; Phillips is Supervisor of the Kaniksu; Martin is a Ranger on the Madison; Porter is Assistant District Forester in charge of Forest Operation, and Weholt is Deputy Supervisor of the Jefferson.

Abbott is supervisor of the Helena Forest; Beatty is in charge of improvement for the District; Breen is Forest Examiner on the Pend d'Oreille; Fitting is Fire Assistant on the Pend d'Oreille; Griffin is a Ranger on the Beaverhead; Phillips is Supervisor of the Kaniksu; Martin is a Ranger on the Madison; Porter is Assistant District Forester in charge of Forest Operation, and Weholt is Deputy Supervisor of the Jefferson.

One hundred and fifteen applications have been received from Forestry School students for summer work. They represent fifteen different Forestry Schools, Cornell taking first place with twenty-four applicants. From the University of Idaho are applications from a native of Russia and of India.

About twenty of the applicants have had previous experience with the Forest Service.

This work has resulted in a reduction in annual losses conservatively estimated at 300 cattle, representing $15,000 at $50 per head.

This shows that the savings resulting from the work have more than retired the investment in one year. All these benefits are being continued and will be continued practically indefinitely since on most of the areas almost 100 per cent eradication has been secured and there is no indication that the plants are coming back or being replaced by new ones.

Larkspur eradication is primarily a business proposition. Not all tall larkspur infested ranges represent practicable eradication propositions. Whether or not a given area is a feasible grubbing project will depend upon the comparative cost of the work with the value of the stock that will be saved as a result of the work.

D. A. SHOEMAKER,
Grazing Examiner.

NOTES FROM THE DISTRICT OFFICE

It is interesting to note that out of the 49 men who attended the first Ranger School Short Course at the University in 1910, A. H. Abbott, D. L. Beatty, J. E. Breen, R. R. Fitting, C. W. Griffin, G. E. Martin, R. A. Phillips, G. I. Porter and Adolph Weholt are still hitting the ball in District 1.

Abbott is supervisor of the Helena Forest; Beatty is in charge of improvement for the District; Breen is Forest Examiner on the Pend d'Oreille; Fitting is Fire Assistant on the Pend d'Oreille; Griffin is a Ranger on the Beaverhead; Phillips is Supervisor of the Kaniksu; Martin is a Ranger on the Madison; Porter is Assistant District Forester in charge of Forest Operation, and Weholt is Deputy Supervisor of the Jefferson.

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In addition to twenty-five of these applicants who will be assigned from the District Office, it is estimated that Supervisors have employed thirty-five Forestry School students direct. — Stillinger.
Forest School Brevities

We have two new men on the faculty this year. Jerome Ramskill takes Charlie Farmer's old desk in the upstairs office as Professor of Forest Engineering. Mr. Ramskill was with the Forest Service in District Four for some years and has lately returned from Burma, where for four years he was logging superintendent for the British Burma Mining Co.

John W. Stephen, Professor of Silviculture at New York State College of Forestry at Syracuse is handling the silviculture courses in Fenska's place. He will be with us only for this year as he is on leave from Syracuse.

Luke Denny and W. E. Fry are the student assistants working with the surveying classes this year.

Sixto Laraya will return to the Philippines immediately after graduation to enter the government service there.

Dan Cupid has been making a great killing in the school. During this school year Christopherson, Bert Cramer, Harlan, MacNerny, Bowers, Kennick, Hoyt, McCoy and Dally have taken the fatal step. Two others are also suspected. They sure combed the country in their search for brides, too. MacNerny went to Massachusetts, Dally to Illinois, Christopherson to Spokane, and the rest nearer home.

A letter from Radtke, now at the Yale camp in Louisiana, states that he likes the work at Yale immensely. We hope that in spite of all temptations he can still say with pride, "Thank God, I'm pure."

Most of the men are already lined up for their summer jobs. The work ranges from trail construction to Ranger positions, and the location from Dakota to California, and Canada to New Mexico.

MacNerny has withdrawn from school to work in the dry kiln of the A. C. M. mill at Bonner.

In a four-cornered match on the Fort Missoula range May 28 the Forestry School Rifle team placed second. The Fort team took first honors with a score of 2654, the School team second with 2652, Corvallis third with 1906, and the Forest Service fourth with 1884. This was the last shoot of the year, and helped wipe out the rather poor records made in the earlier matches of the year. The schol team was composed of Best, Littleton, MacDonald, White, Slaughter, Beall and Cramer.

"Wink" Warner intends to go into some branch of the lumber industry.

Frank Hutchinson will leave next fall for his home in New Zealand, where he intends to enter the Government service. He will spend the coming summer on the Kootenai Forest.

A course in woodcraft is being given in the Forest School this spring. It is proving immensely popular with the co-eds, over thirty girls being registered in this class. It covers such things as clothing, camp equipment, cooking, etc., for the benefit of the tenderfeet.

Charlie Joy will be back in the fall to finish up his course. He expects to receive his diploma at the end of the fall quarter. Charlie will spend the summer in timber survey work on the Kootenai.

Thorpe has already left for his old job in planting at Haugan.

"Spike" Baker, who graduated last year, is taking a business course at the University this year to fit himself for the wholesale lumber business.

Joy, Hoyt, Best, Thorpe, Madsen, Cramer and Laraya took the examination for Forest Assistant last month. McDonald took the Grazing Assistant exam at the same time.

George Dally, who headed the list for the school in the Ranger exam last fall, received his appointment to the Lolo National Forest. However, he will be back next fall to finish his course at the University.

Bill Zeh, '21, stopped in at the school for a couple of days in the middle of April. After a year as Ranger on the Beartooth he has left the Forest Service to become superintendent of timber sales on the Klamath Indian Reservation in Oregon.

E. P. Dirmeyer, '21, has been made secretary of the newly organized Superior Commercial club. Dirmeyer is selling insurance in the Mineral county metropolis.

Ross Williams, '21, made a study of the snowslides in the St. Region canyon that caused so much trouble on railroads this spring. This work is all a part of his job as Forest Assistant on the Lolo.

Dean Eikells, Clarence Riley and Frank Hutchinson gave instruction in the Scoutmaster's Leadership Training course, given at the University this quarter. The dean had several lectures in woodcraft, while Riley demonstrated knots and Hutchinson explained the signaling codes.

Felix Franco visited the school early in March on his way back to the Philippines. Franco obtained his master's Degree at Cornell at the end of the first semester, and will now enter the government service in his own country.

FORESTRY FRATERNITY ORGANIZED

At a meeting of the Forestry Club in May it was decided to install an honorary forestry fraternity, looking toward the securing of a chapter of Pi Omicron Xi, national forestry fraternity. Membership in the local body is limited to junior students whose grades show an average of B throughout their college course. A committee of eligible students was named to draw up plans for formal organization next fall of the new fraternity.
Forest Planting in New York
Professor J. W. Stephen

NEW YORK has been carrying on forest planting on state lands intensively since the year 1906. Since that time it has been the policy of the state to raise the planting stock in nurseries established for the purpose and to distribute the seedlings for planting on lands within the state at the cost of production. Any surplus stock remaining in the nurseries for which there is no demand is planted by the state on state lands. This policy has resulted in awakening great interest among the citizens of the state to raise the planting stock in the nurseries for which there is no demand. The law passed two years ago allowing them to furnish trees free of charge to those who will keep the land in continuous forest production is to go into effect this year. This is expected to increase the annual planting to upwards of fifteen million trees. These trees are all raised in their own nurseries which sometimes contain upwards of thirty million trees and comprise an area of approximately one hundred acres.

The first of these plantations has now been long enough established to get an idea of the early development that can be expected from planting a variety of different species. The figures here given are taken from a plantation consisting of about two hundred acres on a deep sandy loam soil containing abundant moisture and located about twenty-five miles from Syracuse, N. Y. The plantation was established by a large water company on the area surrounding their springs in order to prevent contamination of the water at its source. The first planting was done in 1906 and continued with the exception of one or two years until 1912. This plantation is unique in the number of species used in making the plantation, and also in the different plans used in the arrangement of the species. Each species used appears in pure stands over certain localities and also appears mixed with other species on different areas. It, therefore, gives excellent opportunity to study the different species under varying conditions of composition and soil. All of the plantations have already established forest condition, the grass and weeds having been covered with a carpet of needles. The time required for this ranges from seven to ten years; depending on the species and the spacing of transplants in the plantation. Larch transplant in the plantation. Larch is perhaps the slowest reaching this condition, but because this species sheds all of its leaves every fall it is enabled to do this even before the shade is sufficient to kill off any of its own branches.

The lower branches in most of the plantations have commenced to shade out and it is interesting to notice the difference close spacing makes in this respect. One Scotch pine plantation established in 1906 and spaced six feet by four feet has lost an average of nine whors of branches, or in other words the first nine years of its branch formation have been killed owing to the shade of the other branches from above. In another Scotch pine plantation spaced six by six feet there are but the branches of the first three years' growth that have died. In another way the effect of the closer planting shows in the development of the trees. In measuring the branch development of the trees, the wider spacing shows much more vigorous development of side branches than does that of the more narrow spacing. With six feet by six feet spacing the branches average up an inch and a quarter in diameter while those planted six by four feet average only up to a little above three quarters of an inch making the closer planting far more apt to develop into clean boled timber early in life.

The injuries to the trees thus far have consisted chiefly of the work of the white pine weevil. This insect kills the leader of the tree by boring from the upper bud system down to the first or second whorl of branches. This compels the formation of another leader from one or more of the side branches and the result is a tree with a considerable crook or, as often occurs, with two or more leaders which produces a divided crown and thus injures the merchantable quality of the stand. This injury is most common on the white pine, but it is not uncommon on the Norway spruce, the Scotch pine and the Western Yellow pine. The greatest damage is found in the stands of White pine, where the injury is as great as 75 per cent.

On a mixed stand of Scotch pine and White pine in alternate rows the damage was reduced to about 10 per cent. This suggests mixed planting as being a great advantage especially if the mixture is with a species like the Scotch pine which will grow more rapidly than the White pine during the earlier years of the plantation. This is also the danger period of attack. The presence of the White pine "Bilster rust" in that vicinity is another incentive to planting White pine in mixture with other species, so as to insure a stand even if the White pine should be attacked and destroyed.

The species that suffered the next greatest injury was the Norway spruce, which was attacked very severely in some parts of the plantation. The Scotch pine and the Western Yellow pine were not injured beyond one or two per cent. The Red pine and Larch were the only species in the plantation not attacked by the white pine weevil. This appears to be true of the Red pine everywhere it has been tried, making it a species preferred for planting operations throughout its range. Some injury was caused by snow-break also. This was most abundant in a mixed plantation of Scotch pine and White pine. The Scotch pine had grown faster than the White pine and the snow accumulating on the stiff branches had slid off upon the shorter and weaker White pine, crushing many of them. Considerable damage in the shape of broken branches was also found on the Scotch and Red pine from the same cause.

The accompanying table showing the comparative growth of the principal species of the plantation is of interest in showing the growth of a number of our eastern species with several European species and also with the Western Yellow pine. The largest tree in the plantation is a European Larch planted in 1909 which has reached a height of 35 feet, is 13 1-2 inches in diameter, one foot above the ground and 10 1-2 inches in diameter, breast high. The Larch has made the most rapid growth of any species in the plantation and gives excellent promise of being a valuable addition to our list of trees for forest planting. Average based on 100 trees from each plantation. It was not possible to get growth each year on larch and spruce.

**Growth in Inches Each Year**

<table>
<thead>
<tr>
<th>Species</th>
<th>D at Base</th>
<th>D, B, H, In.</th>
<th>Total Height Ft.</th>
<th>1906</th>
<th>1907</th>
<th>1908</th>
<th>1909</th>
<th>1910</th>
<th>1911</th>
<th>1912</th>
<th>1913</th>
<th>1914</th>
<th>1915</th>
<th>1916</th>
<th>1917</th>
<th>1918</th>
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<tbody>
<tr>
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<td>4.6</td>
<td>3.4</td>
<td>25.3</td>
<td>2.0</td>
<td>2.6</td>
<td>2.9</td>
<td>3.3</td>
<td>3.8</td>
<td>4.0</td>
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<td>4.8</td>
<td>5.2</td>
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<td>6.1</td>
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<tr>
<td>White pine planted 1905</td>
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<td>10.1</td>
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<td>3.2</td>
<td>3.6</td>
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<td>Red pine planted 1909</td>
<td>4.6</td>
<td>3.4</td>
<td>21.5</td>
<td>1.4</td>
<td>1.8</td>
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<td>Western yellow planted 1909</td>
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<td>17.6</td>
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<td>5.8</td>
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A Forest Policy for Illinois
George L. Dally

IN ORDER that we may arrive at a logical understanding of the proposed Forest Taxation of the State of Illinois it is necessary that first we know something of the economic conditions of that state in so far as their relation to Forestry is concerned. Perhaps the best way to do this would be to, in a small way, draw a comparison between Montana and Illinois.

First of all we find that in population, density per square mile Illinois is growing every year. The comparisons since 1870 are as follows:

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<thead>
<tr>
<th>Year</th>
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<th>Montana</th>
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<tr>
<td>1870</td>
<td>45.4</td>
<td>1</td>
</tr>
<tr>
<td>1880</td>
<td>55</td>
<td>3</td>
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<td>1890</td>
<td>68.3</td>
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<td>1900</td>
<td>86.1</td>
<td>1.7</td>
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<td>1910</td>
<td>100.6</td>
<td>2.3</td>
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<tr>
<td>1920</td>
<td>116.7</td>
<td>3.8</td>
</tr>
</tbody>
</table>

From these figures we can draw two conclusions.
1. That the demand is rapidly increasing. 2. That the available forest land is rapidly decreasing.

We find that the lumber produced in Illinois in 1910 was 113,506,000 M. B. F., as near as can be obtained, was:

<table>
<thead>
<tr>
<th>Species</th>
<th>Percentage</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars</td>
<td>22.9%</td>
<td>407,330,000 F.B.M.</td>
</tr>
<tr>
<td>Boxes &amp; crates</td>
<td>26.9%</td>
<td>372,025,000 F.B.M.</td>
</tr>
<tr>
<td>Sash and doors</td>
<td>12.5%</td>
<td>273,070,840 F.B.M.</td>
</tr>
</tbody>
</table>
| Illinois, larger than England, Belgium, Switzerland and Holland combined; with a mean elevation of 550 feet; a mean annual rainfall of 38 inches, a mean annual snowfall of 32 inches, a mean annual temperature of 52 degrees; a population of 6,500,000 people, is today defaced by mill, her industries are facing a crisis because of lack of timber; approximately one-half million homes are facing the disaster of being without income and the whole economic condition of the state is imperiled. This demands prompt forest legislation. What has been done?

Illinois has several sources of revenue, but her principal source is the "general property tax." This includes both real and personal property and is taxed at a supposed valuation of one-third its fair cash value. This we can criticize in the same manner that we can criticize Montana taxes. The land should be taxed not so much upon its cash value as upon its true value. In the language of a Forester this means its production value. This is the first obstacle to be removed in the rebuilding of Illinois forests. In spite of this handicap Illinois is endeavoring to rebuild her forests by two methods.

1. By establishing communal forests which are managed by a political body of five commissioners who are elected to that duty by the voters of the county concerned.
2. By the payment of $10.00 per acre per year for a period of three years to any person who shall plant an area in trees provided that the said person swears that the trees are all healthy and that the trees are not more than 10 feet apart. It is at this point that Illinois' policy in relation to forest policy and her forest taxation stops. It is here that it should begin. Now, assuming that there has been provided an organization for the handling of the timber problem, we are ready to propose tax legislation. We suggest that there be a period of 80 years set as the period of rotation for all forest crops. We choose this period because of the length of growing season and the heavy rainfalls coming at opportune times. Then it will be further suggested that at the end of 80 years each forest owner failing to harvest his crop shall be compelled to pay into the treasury of the state a penalty tax, the severity of which shall be determined by the state legislature.

Beginning at the age of from 15 to 29 years the forests will be producing an annual intermediate yield from both its hard wood and its soft wood forests. This produce should demand a tax payment but because of the present needs of the state it is suggested that this tax be forfeited by the state as an added inducement for the reforesting and afforesting of non-producing lands, provided that the final yield shall produce not less than a certain amount of board feet per acre, this amount to be decided upon by the state legislative body.

At this point there arises the question, "What shall be considered as forestry land?" This depends upon a classification of the soil in its ability to produce. Certainly lands considered as forestry lands in Montana would be considered as agricultural lands in Illinois, due to the difference in the economic needs of the state. It will be the duty of the land classification committee to determine upon a valuation standard. Then upon those lands considered as forest lands must be grown forests, while upon agricultural land tree planting must be prohibited except for ornamental or horticultural purposes unless otherwise granted permission by the state.

"The man who once so wisely said, 'Be sure you're right, then go ahead; Might likewise have added this, to-wit: Be sure you're wrong before you quit.'"
OUR NEW SHACK.

The new Forestry School, now being built as part of the State University's million-dollar building program, will be one of the largest and best equipped forestry schools in North America. In size it is exceeded at present only by the New York State College of Forestry at Syracuse, while in equipment and arrangement it will be the most modern of its kind in the country.

The building is to be 130 by 56 feet, constructed of light red brick on a granite base, with a tile roof. Above the windows on the second floor will be a panel bearing a relief of the Montana Forestry Club emblem, the pine tree and M, in green and brown terra cotta.

The first floor will contain two class rooms, each 28 by 22 feet, a wash and shower room, utilization laboratory, instrument room, two offices, and a library, 48 by 22 feet, equipped with chairs and tables for study purposes, a large open fireplace and book and magazine shelves.

On the second floor are located four laboratories for fire protection, grazing, technology and silviculture respectively, a class room, work room, two offices and an assembly hall, the same size as the library, equipped with a moving-picture booth.

The third floor will be given over to the engineering department. There are to be four drawing labs, two lecture rooms, offices, a dark room, and a blueprint room. Skylights let into the roof will afford plenty of light in these laboratories.

Work on the building is now going forward rapidly, and there is little doubt that it will be ready for occupancy at the beginning of school next Fall. The total cost of the building is $117,000, and $20,000 of new equipment will be purchased immediately.

Other buildings being constructed by the University at the same time are a men's gymnasium, library, men's and women's dormitories, and heating plant. This is only the beginning of the building program which calls for a good many more buildings in the rather near future, in anticipation of the time when Montana will be one of the largest as well as one of the best Universities in the Northwest.

I. A. F. C. NEWS

The annual convention of the Intercollegiate Association of Forestry Clubs was held this year at the New York State College of Forestry, Syracuse, New York, the 19th to 23rd of April.

Montana was represented by “Dick” Fenska, formerly professor of silviculture here, and now professor of Forest Engineering at the New York school.

The program of the convention included addresses by Colonel Greely, United States Forester, Mr. Chapman and Mr. Graves of the Yale Forest School, and prominent lumbermen. Field trips were made to the nearby tracts of the Syracuse Water company and other corporations who are practising intensive forest management on their holdings.

At the business session of the Association, Montana was elected president club for the coming year, receiving ten votes of the fourteen cast. This means that the convention will be held here in Missoula next spring, and that the I. A. F. C. annual will be put out by Montana.

A movement has been started among the western members of the I. A. F. C.—Washington, Idaho, California, Montana, etc., to form a western division of the I. A. F. C., which shall send one representative to the convention on those years when the meeting is held in the eastern part of the country. This man shall carry the proxies of all the western schools, and his expenses shall be pro rated among them, relieving the clubs of the heavy burden of individual representation. It is very likely that this plan will be adopted next year, as it has been very favorably received by most of the western schools.

TRIPOD CARRIER ON CAMERA CASE

Take your camera case to the harness maker and have him sew a bellows pocket on the side to hold your tripod. The new and improved short telescoping tripods are the best to carry this way. Keep your tripod ever at hand and you will have a better collection of pictures.—Rolland Huff, District Ranger, Sumpter, Oregon.
THE YOUNG MAN, FORESTRY
AND THE FOREST SERVICE

(Continued From Page Seventeen)

other trade or profession. The prospective big merchant must learn every detail of his retail trade—buying, credits, etc.—and it means years. The lawyer has at first month after month of sheer uninteresting drudgery. The banker must first learn every detail of the intricate business machinery that makes up the modern bank. And so on—wherever you go in life you will find that the really successful man must start in at the ground floor.

The difference I spoke of as existing between the Service and other professions lies in this: you must develop yourself to a greater degree than you master your actual work. Nowhere else does the superior place so much stress on what the subordinate is doing to improve and so fit himself for higher tasks. There are innate attributes you must develop or suppress, and there are acquired traits you must get and some you must be constantly on the watch to avoid.

Let me briefly illustrate my meaning. Address, sometimes called polish, is a vital necessity in dealing with the public, yet you must beware of getting too much of it. An effusive Forest officer will disgust an old timer-cowman just as much as an unresponsive, heavy one will stand low in the estimation of a modern business man who has something to transact with the Forest.

Address is the kind of trait you must acquire. On the other hand, for an innate quality, take leadership. You hear tell of men that are born leaders. The native quality, take leadership. You hear of men that are born leaders. The native quality, take leadership. You hear of whom they are attracted. To become a leader you must first learn every detail of the intricate business machinery that has in mind and merge your desires with his but use every streak of initiative in you to carry out that intent.

Above all, men, do not fall into an error common to most professions, self-pity and over-valuation of self. Because you go into the forestry competition well-equipped with education and a fair amount of practical experience, don't boohoo if you suffer setbacks and don't exult unduly if you make a hit. You know Kipling's satirical comment on the class of men who do these things.

"If you stop to find out what your wages will be
And how they will clothe and feed you,
Willie, my son, don't you go on the Sea.
For the Sea will never need you."

"If you ask for the reason of every command,
And argue with people about you,
Willie, my son, don't you go on the Land.
For the Land will do better without you."

"If you stop to consider the work you have done,
And to boast what your labour is worth,
Angela may come for you, Willie, my son,
But you'll never be wanted on Earth, dear!"

When you go out in the forestry world you are going to buck some keen competition. For instance, were you to come to me today, you would have some competitors that would astonish you. Among twenty rangers answerable to me, I know five at least who can casually number among their accomplishments the following: Ability to handle large crews of nondescript laborers; ability to estimate timber, do topographic mapping, and appraise timber; knowledge of silvicultural practice, scaling, and business relations with sale operators; who know the protection game from the packing of a brome to the making of an accurate seen and unseen map; who can build cabins, bridges, telegraph poles and trails; who can take stock on the range and handle them to the satisfaction of stockmen; who can write concise reports with definite recommendations; who are not afraid to tell their Supervisor when they think he is wrong. I might mention a few other accomplishments, and I will say that almost all of the twenty can do the MAJORITY of these things. Now you have been given an opportunity denied to some of these men, specialized training. It is strictly up to you whether you are going to use it to advantage or as a means of suicide for your career. It will help you but cannot entirely make your work that you do on the other hand it can entirely make you if you use it wrongly. Education is like some potent poisons—a tonic if correctly used, fatal if incorrectly.

I have tried to show sketchily what the Forest Service means to men entering it hereafter. I have tried to tell you that you are not going into a garden party. On the other hand the Forest Service and forestry in general has two distinct rewards, and I hope to see the day when, watching your careers, I know you are getting these rewards.

The first what may be called the negative pleasure of work well done and the positive pleasure. By negative I mean the thought similar to that which, for instance, comes to a health officer when he knows that a community, apparently against its will, is gradually conforming to his plans for its well-being. By the positive I mean that elation which seeks a man when he sees a dangerous fire corralled—a trail built which he has dreamed of for five years—a timber sale area looking just as he fanned it when he helped estimate it—a cattle range, formerly only partially utilized, now stocked to the full and all the permits pulled for the Forest Service—and so on ad infinitum.

The second pleasure is the personal one. It is the supreme happiness of valued association.

Not long ago I sat in a meeting and idly scrutinized men closely associated with me in the past. Suddenly I found myself recalling scenes and incidents I know I will prize in the years when I shall become an "old timer." Here was a dapper little man, immaculately clad: I have ridden at eleven thousand feet elevation with him when the wind was blowing forty miles an hour and the sudden snowstorm nearly blinding us. We were trying to find out a new trail by which cattle could be put on the range—Hellroaring Plateau on the Beartooth. I saw another man, a big easy-going chap now high in the Service, who more than once has made my tongue hang out as I followed him through the timber and over sliderock, and who once brought me provisions at a back country station my first year in the Service and then went back up on "top" and promptly lost himself and his companions in a fog for three or four days. Again I examined the Deacon, who used to have a vocabulary like a man armed gun. On my return from the Shoshone course at this very school, he wished to try me out, as we rode up a creek. He put his horse through an icy ford that I will admit, made me feel very lonesome when
my cayuse slid into it off the bank. On
the way home I tried to break his neck
by running him a race through some
drifted snow. And then an old chief of
mine. He is now the par excellence of
the dandified man about town. I recall
my last trip with him. We reached a
ranch about eight one night. The own-
ers were a couple who had just reached
there on their honeymoon. He and I
fell a natural impulse to move on. We
did—nearly a damnable trail for twelve miles.
We lost it several times. Once, when
hunting it, I fell in the river. I cried, "I
missed it—don't come here!" He replied,
"Of course not—I'm not a damn fool!"
And another chap that nerved me to han-
dle a bunch of panic stricken men when
all of us were in a tight place in a fire.
When the crisis came I recalled how this
man in 1910, when seemingly surrounded
by fire, tossed his men into going to sleep
a little while. He looked around for a
way out—and found it. He saved his
men, while other crews near him were
burned up. These incidents are trivial,
but I prize them and a multitude of
others.

Are there many jobs in the world that
can pay better than this, with such asso-
ciations? I am only an isolated case.
Every man in the Forest Service of long
experience can quote you similar ones.

In the days to come, when I meet such
of you fellows as have seriously followed
my own profession and have made good,
I want to know in my heart that you can
say with me, in paraphrase, as I said of
these Beartooth men that I knew in the
old time—

"But when I go as a ghost again
To the gaunt, grim buttes, to the friendly
plain,
I know that for all that time can do
To scatter the faithful, estrange the true—
God help, in the lavender sage,
Will be waiting my friends of my golden
age."

This talk so scattered, so represen-
tative of the illogical love of a Service man
for the Service and his faith in his work,
is growing over-long. At the finish, I
ask you this:

Would you want that your profession
ask less of you than mental and physi-
cal "guts"—submission to the discipline
countless fine Service men before you
have found necessary—apprenticeship no
more burdensome than any business
asks—the self-reliance of the truly com-
petent man—open, fair and congenial
competition with men who have shown
their breed?

Can you ask a greater reward than the
personal surety of work well done—an
important work to your community, a
work that will mould you as a man, and
the fine associations that will go with
you get on leaving school till the day
when you cock your heel up on the
stove and say to some old crony, "That
was the golden age—there were giants
then!"
GRASSHOPPER GLACIER.

R. T. Ferguson, Supervisor Beartooth National Forest.

Several rather interesting specimens of a species of grasshopper were collected during the summer of 1914 by Forest Officers on the Beartooth National Forest. These specimens were submitted to the Bureau of Entomology for identification. It is in order to determine whether or not the grasshoppers were as they appeared, an exactly similar species to the common grasshopper so prevalent during the summer months.

A rather interesting legend has traveled throughout the eastern part of Montana concerning the Grasshopper Glacier, so-called, as the ice fields from which these insects were collected is locally known. It was claimed by the early settlers in this region that during exceptionally dry and hot summers when the accumulation of snow from the preceding winter had melted, tons of dead and partially decomposed grasshoppers lay exposed.

These dry years occur only occasionally. For that reason, very few people had really ever seen the grasshoppers, and the story was not generally believed. Those who claim to have seen this phenomenon never brought back any specimens to substantiate their claim, thus lending still greater doubt to the stories told. During the dry seasons the grasshoppers were, however, again exposed and several specimens were collected. The lower half of the so-called Glacier was literally black with the dead grasshoppers. Nearly perfect specimens were originally secured. These were, however, badly damaged in getting them back to civilization, due to their decomposed condition.

The Department of Entomology at Washington found the specimens collected to be without question the migratory locusts Melanoplus spretus, Thomas. It seems that there is a real scientific basis to what was originally supposed to be myth. This species of locusts years ago occurred in vast numbers throughout the western region. Migratory swarms passing over the mountains became chilled when directly over the glacial ices and fell. Tons of them thus accumulated and froze into the ice. This particular species of grasshopper is no longer abundant and the supply will not be replenished in the glacier because none other of our present species are sufficiently numerous and strong of flights to reach such altitudes in great quantities.

The Grasshopper Glacier lies at the extreme head of West Rosebud Creek at an altitude of 1,500 feet. It is surrounded by several of the highest peaks in the forest. At the present time it is a field of ice approximately two miles long and three-fourths of a mile wide. Formerly, it covered an area over four miles in length. The sawtooth and two other isolated ice fields were at that time a part of this glacier. This glacier was first scientifically explored and discovered by J. P. Kimball, M. A. Ph. D., a mining geologist formerly connected with the geological survey.

The glacier itself is disappearing slowly. Were this not the case, in time the grasshopper contents of the glacier would be thrown off at the mouth of the ice field owing to the constant but slow flow of the glacier. There would then no longer be visible evidence of the reason for christening this the "Grasshopper Glacier."

FOR THOSE WHO SCALE LOGS ON THE WATER

A crayon holder made from a "Junket" box (obtained for 15c at any drug store) with a small cork tucked to back end will prevent losingumber crayons in the water. A little adhesive tape wrapped around the box at the top where the crayon fits in will prevent the water softening the crayon.

If tally sheets are saturated with paraffine oil, and a soft pencil used, rain will not affect them.—L. D. Blodgett, Forest Ranger.

BURNT FEED FATTENS NO STOCK

BE SURE YOUR MATCH IS OUT!

---

MARBLE'S

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Marble's Equipment withstands hard usage and never disappoints. We show only a few items—the Marble line includes Safety Pocket and Camp Axes, Hunting Knives, Gun Cleaning Implements, Gun Slits, Fish Gaff, Nitro-Solvent Oil, Auxiliary Cartridges, Shell Extractors and Recoil Pads.

Handy Compass

Don't go on a trip to woods or lake, or even on a motor tour, without a Marble's Compass to guide you right. Made with waterproof screw case. Accurate at all times, for it cannot demagnetize. Safety Coat Compass—Fits to coat or belt, can't get lost, in plain view at all times. Stationary dial, $1.50. Re-volving dial, $1.75. Pocket Compass stationary dial, $1.25; revolving dial, $1.50.

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Both good supply of matches and keeps them dry. Fits to coat or belt. May be quickly opened and closed. Nickel-plated, size of 16-gauge shell, just right for pocket. 65c.

Most good stores sell Marble's Equipment—If your dealer can't supply you order direct. Ask for the Marble Catalog.

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No. 9, a real necessity to every outdoor man. Small enough to carry in the belt, yet heavy enough to be effective. Blade of finest steel, 2 1/4 X 4 X 1/4 inch. 14 inch handle of selected hickory, weighs 22 ounces, $1.50. Sheth, 75c extra.

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**Gurley Forestry Transits**

Are produced by what is undoubtedly the largest and most scientifically equipped manufacturing institution in the industry.

An institution which has back of it the accumulated experience gained in serving the needs of Engineers, for more than 75 years.

It is natural to assume that an institution of which the foregoing can in truth be said—must be manufacturing a product in which will be found all the desired elements of goodness—

Accuracy, Dependability, Permanence of Adjustment, Long Life, and Convenient Handling

For the true measure of worth is not what goes into the transit, but how well it performs.

May we send illustrated Catalog No. W-32?

**FIELD EQUIPMENT AND SUPPLIES, FIREMEN AND FOREST OFFICERS**

(Continued From Page Ten.)

There should be an absolute requirement that firemen or emergency guards going to a fire carry the standard ration of the Forest or Protective Unit. If one insists that a hard-boiled, copper-lined and double riveted timber beast can live only on dough-gods and snus or plug tobacco, let him carry those items also, but require him to carry the ration in addition and you will be sure he need not quit his fire too soon for lack of holes toward the buckle of his belt. The total weight of a complete outfit including food, will vary from 32 to 38 lbs. During fire season, firemen's complete outfits should be kept packed up in a convenient place, and in perfect readiness for immediate start at all times. Failure to have the outfit in readiness should be regarded as a serious breach of conduct.

Ranger, Fire Warden, Supervisor's office men and District Office men should not be required to carry fire tools and emergency rations when travelling afoot. Effective tools and equipment and one day's rations should be a standard requirement.

Rangers, Fire Wardens, Supervisor's office men and District Office men should not be required to carry fire tools and emergency rations when travelling afoot. If travelling by horse or vehicle, effective tools and equipment and one day's rations should be a standard requirement.

**THEY WILL DO IT**

A safety director tells this one apropos the difficulty of teaching some people to observe the rudimentary principles of "safety first."

Wash White got a job in a sawmill. The boss put him in charge of a buzz saw, showed him how the saw worked, warned him of its dangers, and then went away.

Wash was fascinated by the shining, whirling saw. But was it, truly as sharp and terrible as the boss had said? To test it he touched it gently with his finger. Bzz! and the finger was no more.

"Ah, fodder's sake, dere's anudder gone!"

"Buzz saw done cut off my finger, sah."

"How the devil did that happen?"

"Ah dunno, sah," said Wash. "Ah just touched de darn contraption like this an' Po' de land's sake, dere's anudder gone!"
LAND EXCHANGE BILL PASSED.

A great step forward in the conservation movement was recorded when the President signed the land exchange bill, now known officially as the Act of March 26, 1922. This bill originated in the Senate last August and had for its purpose the doing away with of the great number of individual exchange bills pending in Congress.

The Act provides for the gradual acquisition by the Government of the eighteen to twenty million acres of privately-owned forest land within the exterior boundaries of the National Forests so as to secure more efficient administration of the forests. The acquisition will be done gradually, covering perhaps fifty years or more, to avoid economic disturbance. In return for the acquired land the Government will give in exchange areas that may be demarcated out of the forest without impairing the administration of the unit, or will give timber rights to the owner.

In the exchange of land full consideration will be given for local equities involved as in grazing areas, and in all cases the public weal will be considered paramount. All timber cut under rights acquired under this Act will be logged under the supervision of Forest Service officers. The exchanges will be based not on area, but on the true value of the lands concerned. In the acquiring of areas covered with reproduction the Government will give in exchange the right will be limited to a short period of time, normally less than ten years.

**SOME FOREST VALUES**

The work of estimating and appraising the value of the destructible resources in the forests of District 1 is carried on continuously and figures are revised from time to time as better data become available.

The figures given below are based on the best available estimates of quantities and classes of material and on values as follows: For merchantable timber, the current average stumpage prices; for grazing values, current grazing fees; for protection a purely arbitrary value of one dollar per acre; and for young growth a flat arbitrary rate for all ages and types of five dollar per acre.

The net area of National Forest land in District One is 22,466,000 acres, a very large part of which is occupied by the high mountain ranges which support no producing power under any crop other than forest, that a forest crop furnishes useful employment for labor to a value of several times the value of the raw material, and that there are recreational and aesthetic values which are not considered above because we have at present too little information regarding them to warrant placing even an arbitrary value on them.—Howard R. Flint.

When you’ve lost all the guides off your $1.00 fish pole, the hooks from a pair of old shoes may be used to very good advantage by flattening the hook and binding it to the pole, leaving the loop as a guide.—C. B. Stillinger, District Office, Missoula.

<table>
<thead>
<tr>
<th>Merchantable timber</th>
<th>$96,638,000</th>
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<tbody>
<tr>
<td>Annual Range Value</td>
<td>221,000</td>
</tr>
<tr>
<td>Young Growth</td>
<td>37,935,000</td>
</tr>
<tr>
<td>Protection Forest</td>
<td>4,118,000</td>
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If the Forests were able to sell the annual growth, which under present conditions is estimated to be 964 million feet B. M. the revenue at current stumpage prices would be $1,564,000 per year, to which could be added an annual return of $221,000 for forage, making a total possible revenue of $1,785,000. At present because of inaccessibility and lack of demand but a small part of this yield is marketed.

Based on the net forest area of 22,466,000 acres the value per acre of resources is $6.18 and the annual growth in wood and forage with the Forests in their present undeveloped condition is about 8 cents per acre or approximately 1.3 per cent on the valuation of the destructible resources. While this appears to be a low rate of return it must be remembered that the amount is large in the aggregate, that most of the land would have little or no producing power under any crop other than forest, that a forest crop furnishes useful employment for labor to a value of several times the value of the raw material, and that there are recreational and aesthetic values which are not considered above because we have at present too little information regarding them to warrant placing even an arbitrary value on them.—Howard R. Flint.
A GOOD EMERGENCY CAMP OVEN

"It quite frequently happens that a fire, or other large crew, will go in the field without any means of baking bread in large quantities. When this happens, excellent results can be obtained by means of an oven built according to the following directions:

Level off a space on the ground about 18 by 36 inches and floor it with smooth rock, then build a wall about 15 inches high surrounding it on three sides. The corners can be turned a little on the fourth side, but an opening wide enough to take the largest dripping pan in camp should be left.

Next cover the top with large flat rocks, covering all the cracks on top with smaller pieces. If there are any empty tin cans in camp, flatten them out and lay them over the top, the idea being to keep earth or sand from trickling through onto the bread. If nothing better can be found, cut a lot of grass or weeds and spread over the top. Then cover the entire oven, except the opening in front, with about one foot of mineral soil.

The oven is now ready for business. Build a fire inside of it and keep it going until the oven burns clean. It will be noticed that, when the fire is first started, soot will gather on the inside of the oven; after the fire has been going about an hour this will burn off. The oven is then in the right temperature for baking. Rake out the fire, put the bread in the oven, hang a couple of wet sacks over the opening—or close it with a rock, using wet sacks to chink the cracks—and leave the bread in the oven for about one hour.—John H. Clack, Missoula National Forest.

HOW TO SMOKE FISH

Catch Fish—Any kind of trout will do, although red bellies over ten inches are preferable.

Clean Fish—You should know how.

Salt Fish—Sprinkle salt along inside of backbone in about the quantity ordinarily used in salting fish for cooking. (rock salt best.)

Smoke Fish—After salting, place fish in pan and cover completely with cold water.

Dry Fish—After soaking about twelve hours, remove from water and place on canvas in the sun, turning frequently.

Smoke Fish—After drying for three or four hours, place on racks in smokehouse far enough apart so that fish do not touch one another. Smoke 24 hours and turn.

Pack Fish—After smoking for 48 hours, pack lightly in wooden box which can be nailed tightly enough to keep out flies.

Store Fish—Place fish in cool, dry place and keep files off.

A HINGED FLAGPOLE

FOR THE RANGER STATION

Three cedar posts are required; two about seven feet long and one about three feet long. These poles are all set in the ground about three feet, the shortest one being between the long ones. After they are set and firmly tamped, there will be about one foot of soil below the long ones. The oven is then hewed to fit snugly between the posts set in the ground and three holes are then made through the flag pole to correspond with three holes drilled in the posts. The flag pole is then laid in position and a bolt inserted through the lower holes when the flag pole can be raised to position by means of pewee poles or the rope on the pole. When the flag pole is in erect position, the other two bolts are inserted and tightened up. Care must be used in having the posts set in ground plumb and also the holes drilled must be in a plumb line. This flag pole can be lowered to repair, paint or put in new rope at any time.—H. E. Flack, Forest Ranger, Holy Cross National Forest.

RANGERS USE CARRIER PIGEONS

The carrier pigeon has demonstrated its worth in the Idaho National Forest, and will be installed next year at all protective camps in that district. As a means of quick and certain communication between the ranger out on the fire line and headquarters, the carrier pigeon has no competition. One bird, after a preliminary course of training, was taken on a rough trip by pack horse, kept overnight at its destination, and released the next day. The pigeon was back at its coop, at headquarters, 30 minutes after it was released, having covered 18 miles, air line, and flown over a high mountain.

In the face of fire, this performance was equaled. A ranger took two birds to the spot where smoke had been located. The first bird carried instructions to send help. Not long thereafter the fire fighters at the front had brought the blaze under control. The second bird was released, countermanding the first order. It reached headquarters just as the summoned assistance was about to start for the fire, and the message it carried saved a number of men from making a long trip.

A HINGED FLAGPOLE

FOR THE RANGER STATION

Three cedar posts are required; two about seven feet long and one about three feet long. These poles are all set in the ground about three feet, the shortest one being between the long ones. After they are set and firmly tamped, there will be above ground, about four feet of two poles or posts spaced about eight inches or so apart, depending upon the size of the flag pole to be erected. The butt end of flag pole is then hewed to fit snugly between the posts set in the ground and three holes are then made through the flag pole to correspond with three holes drilled in the posts. The flag pole is then laid in position and a bolt inserted through the lower holes when the flag pole can be raised to position by means of pewee poles or the rope on the pole. When the flag pole is in erect position, the other two bolts are inserted and tightened up. Care must be used in having the posts set in ground plumb and also the holes drilled must be in a plumb line. This flag pole can be lowered to repair, paint or put in new rope at any time.—H. E. Flack, Forest Ranger, Holy Cross National Forest.

RANGERS USE CARRIER PIGEONS

The carrier pigeon has demonstrated its worth in the Idaho National Forest, and will be installed next year at all protective camps in that district. As a means of quick and certain communication between the ranger out on the fire line and headquarters, the carrier pigeon has no competition. One bird, after a preliminary course of training, was taken on a rough trip by pack horse, kept overnight at its destination, and released the next day. The pigeon was back at its coop, at headquarters, 30 minutes after it was released, having covered 18 miles, air line, and flown over a high mountain.

In the face of fire, this performance was equaled. A ranger took two birds to the spot where smoke had been located. The first bird carried instructions to send help. Not long thereafter the fire fighters at the front had brought the blaze under control. The second bird was released, countermanding the first order. It reached headquarters just as the summoned assistance was about to start for the fire, and the message it carried saved a number of men from making a long trip.

HOW TO SMOKE FISH

Catch Fish—Any kind of trout will do, although red bellies over ten inches are preferable.

Clean Fish—You should know how.

Salt Fish—Sprinkle salt along inside of backbone in about the quantity ordinarily used in salting fish for cooking. (rock salt best.)

Smoke Fish—After salting, place fish in pan and cover completely with cold water.

Dry Fish—After soaking about twelve hours, remove from water and place on canvas in the sun, turning frequently.

Smoke Fish—After drying for three or four hours, place on racks in smokehouse far enough apart so that fish do not touch one another. Smoke 24 hours and turn.

Pack Fish—After smoking for 48 hours, pack lightly in wooden box which can be nailed tightly enough to keep out flies.

Store Fish—Place fish in cool, dry place and keep files off.

The Call of the Last West

Anacostia Copper Mining Company's Western Montana logged off lands; excellent opportunity to purchase direct from the company with promotion or commission charges; low-price agricultural land; 19 yearly payments. Values fixed by experienced appraisers. Our holdings cover a country of unparalleled fertility, salubrious climate, ample moisture, rapid growing seasons, beautiful mountain scenery, railway transportation, telephone, telegraph, good schools, electric light and power, and many other advantages which combine to make it the finest and richest section in which to live and work in the entire Northwest. Address

Blackfoot Land Development Co.

DRAWER 1590

MISSOULA, MONTANA
SOLVING DETECTION PROBLEMS IN
THE WINTER

(Continued From Page Eleven.)

between the station and the fire. Everything above the triangle and beyond the ridge in the direction of the fire point can be seen from the station, nothing below. If the plotted point representing the fire is below this line the lookout man was right. If it is above, he is wrong, assuming, of course no haze, glare, smoke or direct rays of sun.

You will readily see how easy it will be to find out just what can be seen from the station on that profile. Keep the edge of the triangle on the station point, in the profile, and with that as a pivot follow your profile line through. Just as soon as you get to a point on the profile that can't be touched by the edge of the triangle without intersecting or cutting the profile between the point and the station you are at the beginning of an unseen area. Its end is the first point on the profile that allows the straight edge, which by the way would be your line of sight were you on the peak, to intersect it without cutting any previous part of the profile. Measure that distance. Say your profile was 10 inches long, horizontally and that the unseen areas added together amounted to 6 inches, 6-10 or 60% of the country along that profile is unseen. If your map and your work is accurate, you are not guessing, you know that you can see only 40%.

It has taken several times as long to tell how to plot and use the profile as it would to make it. In the first place you wouldn't except for practice, plot every contour. To find whether that fire could be seen would take at the outside 5 minutes, for it would be necessary to plot only the station, the fire point and the possible intervening ridges, half-a-dozen notations in all. Try it.

The analysis of the efficiency of a station can be accomplished by a series of profiles radiating from the station as a center to the maximum effective range of vision. These should not be less than 30 degrees apart. It will take you about five hours computing time per station. If you determine the percentage of seen and unseen on each profile the percentage of efficiency of the station is the average of all. If, instead of locating your profiles as radii around a point you take them at intervals along a patrol route you can approximate its efficiency per cent.

There are some constant sources of error that creep in the analysis of stations or routes by this method. Topographic maps represent elevations on the ground, not the elevation of tree tops. If a ridge is covered with trees add the heighth of the trees to the map elevation. Again, except for prominent peaks or bench mark points, elevations are given only to contour intervals. You must estimate from your knowledge of the country and the slopes whether the top of a ridge will average 10, 50 or 75 feet above the highest contour shown. Taking half the contour interval and adding it to the elevation of the last contour on each ridge is probably the best solution. If the station has a tower add the height of the tower to the elevation of the peak in plotting the cross section. You can also assume that any fire starting 50 feet or less in vertical elevation below the line of sight can be seen. The smoke will be close enough to the actual fire to warrant accurate location.

Don't be surprised at the results. You will find highly thought of peaks are sometimes very inefficient. The average of seen territory is about 50% and that on the more favorable situations. Since you rarely have as many men as you desire take down your map and work over your Detection scheme this winter. Analyze high points and low ones. Some Rangers have found slight shifts in the location of Detection men has increased their district efficiency from 10% to 20%. Before you build a lookout cabin or tower compute its rating. Do it at home.

AERIAL FOREST FIRE PATROL

(Continued From Page Fifteen.)

chances on seeing through smoke and haze to watch conditions. The inability of the airplane to fly effectively immediately after thunder storms, due to low hanging clouds, may be cited as another disadvantage. However, low hanging clouds present certain difficulties to the stationary lookout.

Before the Oregon patrol actually started operations, it was thought by many that accurate location of a fire could not be obtained from an airplane. While the lack of detail and accuracy of the maps did interfere to some extent, fair accuracy was secured. The observers were given ample opportunity to learn their routes before the season started. By so doing, over ninety per cent of the fires discovered were reported within a quarter of a mile of their actual location, as checked by the one in charge of fighting the fire.

The speed of the patrol, promptness in reporting, and general utility are shown by the fact that the Oregon patrol sighted 720 fires out of a possible 1100, and of the number sighted 485 received credit for first reports. These figures are not to be sneered at.

The effect of the aerial patrol is not solely confined to detection. They may be used in transporting foremen and material where landing places may be found. Parachutes may be used effectively where such landing places are lacking.

Notwithstanding the advantages of the aerial patrol over the lookout system, in many instances it cannot be supposed by even the most enthusiastic advocate of aviation, who knows the problems of fire protection, that aerial patrol should supplant the lookout system, since the lookouts are constantly operative.

However, so much as the lookout system is needed, so also is the aerial patrol. Each supplements the work of the other effectively, and by an efficient combination of the two systems, an organization can be developed which will be able to find all of the forest fires before they have gained sufficient volume to become dangerous.

In conclusion it is the opinion of the writer that the future detection system should include both the stationary and moving aerial patrol. The increased promptness and greater certainty in finding all fires while they are small will demand both systems, despite the additional cost of operating planes.

SUMMER WORK

(Continued From Page Twelve.)

party and covered a great deal of country.

Fat Karr spent his time as graving guard on the Beaverhead. Red Best spent the early part of the summer panning gold up the Blackfoot, but ended up with telephone construction on the Pend d'Oreille.

Dean Skeels was in charge of the land classification work of Garfield county over in Eastern Montana, and employed several of the students on this work. The field force consisted of Pierson, Gates, Peterson and Painter, and these men were later reinforced by Fields, who had begun the summer as fire guard on the Jefferson. The office force were Schwand Shope, map makers, and Misses Lannon and Norman, stenographers. The work consisted in classifying the whole country for taxation purposes and means during the early part of the summer, three million acres of buttes and coulees with never a patch of shade but that of sage and cactus, and nights spent on the open prairie with coyotes and side-winders for bed partners.

For the benefit of the vocational students a summer school session was held at the Forest School, E. P. Dirmeyer, who graduated last June, was acting Dean and he and Peg held classes for about twenty vocational students. The work covered in this course was of great value to the men in putting them on more of an equal footing with the regular students.
The cover picture for this issue of The Kaimin is an official Forest Service photo, taken by K. D. Swan, publicity officer for District 1. The subject is Ranger Bowman of the Beartooth Forest.

The center spread is composed largely of Forest Service pictures also. We wish to thank the Service for its courtesy in permitting us to reproduce them in The Kaimin.

The picture of the wild goats was taken in Glacier Park by George Mollander, a University student who was formerly a guide in the Park. The camera was snapped by means of a wire stretched along the ground so that when the goat walked into it, the shutter was operated. Salt was used to lure the animals within range of the lens. The small animal in the foreground is a whistling marmot, or woodchuck.

Douglas Roberts, who was here in the Short Course of 1917, let the Art Editor have the pick of his entire collection, while the rest of the pictures were obtained from men in the Forest School.

THE SCHOOL OF FORESTRY
(Continued From Page Seven)

cr.; Geology, 3 cr.; Insect Control, 3 cr.;
Tree Diseases, 3 cr.; Forest Appraisals,
3 cr.; Grazing, 3 cr.; First Aid, Camp
Surgery and Medicines, 1 cr.

Expenses of the Ranger School
Expenses for Ranger School students
have been made as little as possible. En­
trants who own drawing instruments
should bring them. Forest officers who
attend the school should correspond with
the dean of the school about certain books
and forest equipment which may be
brought from their forests.

The cost to the average Ranger School
student is about as follows:
Registration fee $3.50
Student Activities fee 3.00
Library Deposit (subject to refund) 3.00
Laboratory fees 1.00
Books and notebooks 10.00
Board and room, 12 weeks 85.00
Forest club dues and entertain­
ments 5.00

Add for drawing instruments,
If purchased 12.50

$123.00

Additional copies of this magazine may
be obtained for 25 cents a copy upon ap­
plication to the Forestry Club, State Uni­
versity, Missoula, Mont.

If you have a friend interested in for­
estry, you will confer a favor on him and
upon us by passing a copy along.

USE WATER ON YOUR CAMPFIRE
HANDY ICE STORAGE FOR THE RANGER STATION

I have a scheme for keeping ice at ranger stations, which is good and could be used by a great many other forest officers which are located out in the hills where it is impossible to purchase a piece of ice as needed.

I have a hole in the ground approximately 8 feet square and 5 feet deep in a rather shady spot, and where a snow drift lies each spring. The drifted snow fills up the hole and settles almost as hard as solid ice. When it has melted down about level with the ground I shovel some sawdust over it and the ice keeps there all summer. The ice hole is conveniently located and furnishes excellent ice for house use during the summer. It is conveniently located and furnishes excellent ice for house use during the summer.

In the fall I have the sawdust shoveled out and ready to cover up the ice for another season.

This convenience may be bad at very little expense, the digging of the hole can be done at odd times and it requires but one large wagon load of sawdust, or two smaller ones.—E. E. Stock, Forest Ranger, Minidoka N. F.

CARE OF GAME MEAT IN CAMP

Many hunters upon killing a deer in the morning think they have to get it into the shade. This is a mistake. When the deer has been dressed, split the carcass full length and spread well open in order that it will cool. Leave it where the sun will shine directly on it, the flies will go under the carcass and will not touch the flesh. It is safe to leave a deer until noon if cared for in this manner.

It is an easy matter to pack a large buck on a riding saddle or pack saddle, but many hunters have trouble in loading a deer on a bareback horse. Cut the head from the carcass and split the backbone through to the hide, load the carcass lengthwise with the horse with the flesh side up. Tie the hind legs under the horse's neck and the front legs around the horse's rump, pass a small rope around the body to act as a surcingle and you are ready to go.—S. R. Bennett, Forest Ranger Malheur National Forest.

TO MAKE A JACOB STAFF

We have found the following Jacob staff far superior to any tripod or Jacob staff sold as such, for ordinary compass surveying or for running line on timber cruising strips. Purchase a light, good quality garden hoe—$1.25; have blacksmith cut off head, straighten and sharpen shank—25c; cut the handle off at about shoulder height and work down to fit into ball and socket joint of F. S. Standard compass with rasp and pen knife. The resulting steel shod staff can easily be driven into the ground as a firm support for a compass. It is also an effective means of offense or defense when dealing with porcupines, range cattle, etc.—J. W. Stokes, Minidoka N. F.

HORSE SENSE

If you work for a man, in heaven's name work for him. If he pays wages that supply you your bread and butter, work for him, speak well of him, think well of him, stand by him, and stand by the institution he represents. I think if I worked for a man, I would work for him. I would not work for him a part of his time, but all of his time, I would give an undivided service or none. If put to a pinch, an ounce of loyalty is worth a pound of cleverness. If you must vilify, condemn and eternally disparage, why, resign your position, and when you are outside, damn to your heart's content. But, I pray you, so long as you are part of an institution, do not condemn it. Not that—you will injure the institution—not that—but when you disparage the concern of which you are a part, you disparage yourself. And don't forget, “I forgot” won't do in business.—E. Hubbard.
BURNING HOMES

"On the third day of last August a man set fire to more than a score of homes. Every home was entirely consumed and there was no insurance. The men went on his way, if not rejoicing, at least without visible evidence of regret. He had no fear of punishment because the homes he had destroyed were not yet built; they were still in the tree trunks awaiting the magic wand of industry to give them habitable form. But economically these homes were destroyed as surely as though the trees had been made into lumber and the lumber into structures. And this is the way it happened:

"It was the vacation season and an automobile carrying a party of tourists stopped on a road that wound through a magnificent stand of Douglas fir, in Western Washington. The travelers sat in the machine before him he located the fire approximately, then returned quickly to a mountain fire station ten miles away.

"After what seemed an interminable wait, the patrol noted various gangs of men at work. They were combating that most terrifying, most ungovernable and dangerous of all rebellious elements—the forest fire. For a day and a half and another day the battle waged. Grimy men, black as the charred trunks around them, worn to the last stages of exhaustion, fought on—cutting away underbrush, dynamiting logs and trees, beating out the smoldering fringes of advancing ground fire, shouting one to another above the crackling inferno of heat and smoke, panting like hunted animals around the water barrels where they slaked their thirst with the lake-warm liquid, but gaining, almost imperceptibly at first, yet gradually with greater certainty as the weary hours dragged on. And amid the confusion and crash of falling timber the ranger and his foremen garnered the battle.

"Several days later a wide, barren scar lay upon the mountainside, still smoldering in places where the black splinters of the charred stumps pointed like accusing fingers, and still sent out masses of yellowish white smoke. The scar covered hundreds of acres and it would continue to smolder and smoke for weeks, while all about in the adjacent woods were fire guards constantly vigilant to see that the enemy did not creep out and strike again.

"And far away the automobile tourists journeyed care-free and utterly unconcerned. At a sawmill they stopped for a few minutes to watch the logs in slow procession from the pond to the band saws. "What a shame," exclaimed the man with the cigarette, in a burst of sentimental revolt, 'What a shame to cut down these beautiful trees!'"—National Lumber Bulletin.

MAKING A PUMP

A lodgepole tree was selected, felled, split, and two pieces 2x10x10 and two pieces 2x3x10 were hewed out. These were nailed together, forming a wooden pipe about 3x3. Wooden clamps were then made and put on the pipe to hold it tight together. The seams were caulked with moss, then a pole was hewed to fit the pipe and to this was fastened a valve made from a part of a canvas pack bag. This was the plunger. To this plunger a handle was fastened similar to an ordinary pump handle.—Claget Sanderson, Forest Ranger.

Mary had a pair of knees
Way back in days of yore,
Which Mary used to cover up
But doesn't any more.—Ex.

A Great Outfitting Store

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Many of the lines specially advertised in this annual will be found here in regular stock, while we are factory agents for many others.

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SMOKE HOUSE FOR FISH

Smoke house should be 4 feet square and 8 feet high, and may be built of lumber and canvas, or of canvas stretched over corner poles. Blankets, burlap or most any material that will keep smoke in may be used, the main idea being to construct the house so that the smoke will not escape.

Racks should be made of wire netting or willows, the meshes to be not over three inches square. Three racks in an 8-ft. house are sufficient. Place the top one 9 inches from top of house and the others a similar distance below top rack. Be sure that racks are solid and will not tip or allow fish to drop.

Fireplace should be in bottom of smoke house. Best method is to dig a pit 3-ft. square and 18 inches deep with a vent ten inches wide running on a level with bottom of pit to a pit four or five feet outside of house. This is an air vent and provides a draft for fire. Cover bottom of pit with flat rocks.

Fuel should be alder branches (this willow can be recognized by the little white cone it bears) cut the branches (the larger the better) about 2 feet long, trim all leaves away leaving bare branch.

Fire should be laid as in a charcoal pit; that is, two thick pieces lengthwise of the pit about 20 inches apart and then a layer crossways full length of pit, then a layer lengthwise, etc., until top is slightly above pit. Bank the fire all around with mud and on top about 4 inches thick, leaving small vent in front and back for draft and for kindling fire. Kindle fire with shavings and the alders will burn readily, the mud keeping the flame down and the smoke escaping through the vents at front and back. Five layers of the alders will last about two hours and then the fire may be replenished by slipping new alders through front vent and under the mud which will have caked by that time.

Protect smoke-house and surrounding shrubbery by digging trench around pit inside of smokehouse and filling it with water occasionally. It is also well to wet ground and smokehouse down occasionally.—C. B. Stillinger, District Office, Missoula.

EQUIPMENT FOR WORK ON SKIS

Many of the ranger districts over the National Forests are located in regions of heavy snowfall and very often rangers are called upon to use snowshoes, or ski, during the course of their duties.

To the inexperienced a long trip may prove extremely difficult and be accompanied with much discomfort if proper precautions are not taken beforehand. A successful ski trip will depend largely upon the equipment. Don't let some native convince you that most anything will do—that softwoods are good enough, or that a piece of small rope is sufficient to tie them on, or that you will not need them tied on. Also their advice on using the pole, especially riding the pole, can better be mostly disregarded.

Proper balance and absolute control of the ski are essential. Leaning to one side as required when using a pole creates an unbalance. It should be discarded in favor of no pole or two push poles or sticks. Did you ever try to climb a hill when the snow is “just right” to cause a slipping of the foot when the ski are tied on with rope. If not, avoid that experience. Have the ski equipped with adjustable leather binders that fasten them to the feet securely. Who would start across the country with no fastening whatever in view of the possibility of one ski, or both, gliding to the bottom of a mountain canyon, after you have leaned a little too heavily on the pole at your side and invited an accident. After rubbing the snow out of your eyes it is somewhat discouraging to view the trail they left behind. Select hardwood for skis even at greater expense, because it can be depended to slip “all the time” if properly waxed with any of the many preparations.—William F. Cochran, Routt Forest, Columbine, Colorado.
Missoula

The seat of the State University of Montana, sends greetings to all foresters and others, who receive this magazine of the School of Forestry.

Missoula is "a fine little city in a fine big country" and here conditions are all that can be desired by those who wish to pursue a University course.

Missoula is metropolitan in every way. It is ideally located in the heart of the Rocky Mountains and the Bitter Root mountains. It is a city of homes and has attained the title of "The Garden City." Missoula offers much for the student, especially foresters. Huge lumber mills—three of them—are located in and close to the city; forest covered mountains rise on all sides; practical work in forestry can be had any afternoon by taking a trip into the hills.

Missoula offers every co-operation to students and a large majority of those who come here to attend the State University are able to be partially self-supporting through the co-operation of merchants. Missoula is a likeable city in every way and the students are made to feel at home from the minute they arrive. It is a "real" University city in all that implies; it is clean, physically and morally. You will like Missoula and after your college course we know we will have a friend in you.

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