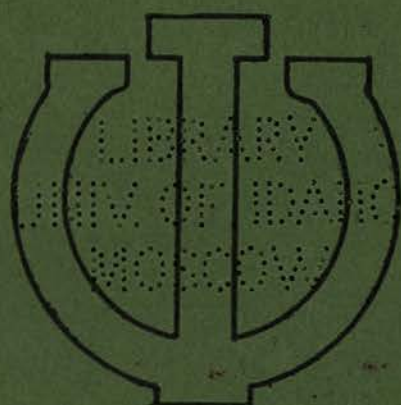


SCHOOL OF FORESTRY
UNIVERSITY OF IDAHO
MOSCOW, IDA.

THE IDAHO
FORESTER



SCHOOL OF FORESTRY
UNIVERSITY OF IDAHO
MOSCOW, IDA.

1917

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UNIVERSITY OF IDAHO
MOSCOW, IDAHO

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No. 65—Russet leather, soft toe cap.

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The above numbers are but a few from the complete line we have in stock, both for men and women.



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- No. 1 is our heavy weight, made of 13-oz. Government Olive drab cloth, cut full in all dimensions, coat style, low military collar, two large pockets, buttons to match color of cloth.....\$4.75
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Every Season

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FORESTRY, U. OF I.

(TUNE:--SOLOMON LEVI.)

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And we're wild and wooly and tough.
We pack the bronks and fight the fires
And do everything else that's rough.
We're always light-hearted and free from care,
As we hike for the mountains on high.
But you'll always find us ready to fight
For dear old U. of I.

CHORUS. Who are we, sir?
Forestry men are we.
From U. of I., sir
And we shall always be——

YELL Ho! Hoppitty! Hippitty! Hi!
Forestry-Forestry! U. of I.
HO HI! HO HI!
Forestry-Forestry; U. of I!

We cruise the timber and map the land
And learn to herd the sheep.
Whenever there's something about to drop
You won't find us asleep.
If you will look about you
As you roam the lands afar
You'll always find things up to date
Wherever we foresters are.

CHORUS.

Dedicated to the Forestry School, University of Idaho, by
George L. McMullin, Oscar C. Munson, Hugh H. Swan.

THE IDAHO FORESTER

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Lookout Development in North Idaho

(O. C. MUNSON)

It will be recalled that each of the fire protective associations of north Idaho gets a certain portion of the "Week's Law" money for the protection of the forests on the headwaters of interstate navigable streams. The part of this appropriation falling to the Potlatch Timber Protective Association, about \$1100, was used, last summer, for a scientific study of lookout development and related problems. After consulting with Forest Service officials, the officers of this Association decided to carry out the work along the following lines:

First, to determine accurate location and elevation of each lookout point, and to establish a meridian on each.

Secondly, to make a topographic map of a portion of the territory.

Thirdly, to make a relief map of the same territory, and

Lastly to make panoramic sketches from some of the lookouts and to sketch on a map the territory which can be seen from each lookout.

To carry out this plan, four upperclassmen from the University were chosen and the work was done by these men during the months of June, July, and August. In addition to this prescribed work, these men found time to traverse a good many miles of trail, marking them every quarter-mile, to do a little trail cleaning, some patrolling, a little fire-fighting and all of their cooking and drafting.

Some of the details of the work and some of the results are outlined below.

Locating Lookout Points

The lookouts were located with respect to land survey corners and the determined locations checked by triangulation. The elevations were all determined by trigonometric leveling. A true north and south line was marked by permanent hubs on each

lookout visited. This meridian was established by solar observation in each case, using the Burt Solar Attachment on a Gurley transit. This work was accomplished with very little difficulty.

The Topographic Map

The country mapped last summer consisted of a little over thirty-six sections and lay in the four townships surrounding the Elk Butte lookout. The scale used was eight inches to the mile and the contour interval, fifty feet. The gridiron method was used.

The primary control system was run out on the section lines by a two man party. Elevations were carried with an Abney Hand Level and lines were run with a small, aluminium, Forest Service sight compass. Both instruments were used with Jacob staffs. Horizontal distances were measured with one of the new two and one-half chain tapes graduated for slope corrections.

In some parts of the country covered, a mile of line was all that could be run in a day, while as much as two miles and a half were made in open country some days.

With the base or control lines well established, the cross-sectioning or gridironing began. For this work the aneroid barometer was used. Strips were run a quarter-mile apart across the sections, the distances being paced.

The average error of closure for the entire summer's work was ten feet to the mile in elevation and forty links to the mile in horizontal distance.

The Relief Map Pattern

The task of building the relief map from the contour map after the field work was completed was neither particularly difficult nor very expensive. Concerning the methods, I shall quote from the report of

Mr. Humiston, the Secretary-Treasurer of the Association.

The horizontal and vertical scale of eight



THE BASE MAP
Showing Method of Building Up Contours

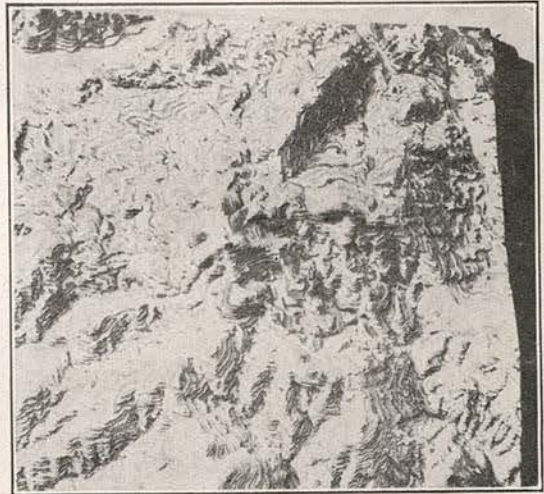
inches to the mile was used, this being the scale adopted for all field work, as previously stated. This is roughly 1.51 inches to the thousand feet and brought the contour interval of 50 feet to .0755, or about 5-64ths, of an inch.

We endeavored to buy card board, straw board, pulp board, trunk board or tar board of about this thickness, with which to build up our map, but were unable to secure anything even approximating the required thickness. For this reason we were compelled to fall back on lumber and selected clear white pine as being best adapted to our purposes. We took this lumber to the planing mill and explained our requirements. The lumber was resawn to a little thicker than required and was then put through a planer.

We made a base of three ply white pine inch lumber surfaced all round, the center layer running at right angles to the two outside layers and were prepared to go ahead with our relief map.

A piece of pencil carbon was laid, face down, on a piece of the thin lumber and the topographic or contour map was laid on this, face up, and was fastened with thumb tacks. With a steel stilus the lowest contour line on the map was then traced its entire length. Then the second or next higher contour was traced in the same manner on the same piece of thin lumber and without having removed the thumb tacks. This made *two contiguous contour lines* on the same piece of lumber. The tacks were then removed and the lumber was taken to a scroll saw where it was cut out on the *lower* contour line only. It was next carefully and securely attached to the laminated base by very fine brads, scattered well over the entire surface.

A second piece of lumber was then placed under the pencil carbon paper and the original contour map and fastened down on it as before and the *second and third* contour



COMMENCING TO SMOOTH OFF THE EDGES
AROUND THE PEAK

lines were traced through with the stilus. The lumber was next sawed out on the *lower* of the two contour lines on the piece. It will be seen that what was the lower contour line of the second piece was the upper contour line of the first piece laid and that these two lines were identical. Hence, if the second piece was the upper contour line of the first piece laid and that these two

lines were identical. Hence, if the second piece were so laid on that its edge just matched the line of the second contour on the first piece of lumber laid it would come just right and without any trouble or liability of error.

The entire relief map was built up in this way and when this part of the work was completed the map showed all hills and valleys as a series of little steps, each representing a 50-ft. contour interval.

In order to fill the angles and smooth off the map we made a composition with a beeswax base and heated it and painted it all over the map with a brush while quite hot. By the use of knives the superfluous composition was carefully scraped off so as to just barely expose the edge of each little step. Rough places were rubbed down with the fingers and occasionally the knife blade was heated in an alcohol lamp to facilitate the smoothing process.

The Relief Map Matrix or Mold

The completed pattern was laid, face up, on a good substantial table, which supported the base of the pattern at every point, and was very carefully leveled. A form made of two-inch surfaced lumber, was built closely about the outside edge of the pattern and this box was carried up to a point about three inches above the highest point on the pattern. The best side of each stick was placed in and the box was well nailed at the corners, but not to the base.

The entire surface of the pattern and the inside of the box were given two or three coatings of a thin paste made of castile soap and when dry the pattern was ready for casting the matrix or mold. It is possible that a thin coating of hot paraffine would be even better than soap to prevent the pattern from sticking.

Some doubt was felt as to the best material to use for the matrix and, being in a little town, no expert advice was available.

After considerable discussion it was finally decided to make the matrix of com-

mon wall plaster, which was done. That which was to come next the face was carefully screened to remove all fibre and hair but the balance was used just as it came from the sack, without sand. The consistency was such that it was as stiff as possible in order to run slowly and settle into every depression without tamping. Considerable metal reinforcing was used, most of it consisting of heavy wire netting in as large pieces as possible. When the top of the form was reached the mortar was carefully leveled off with a straight edge and troweled down to a smooth surface.

Five sacks of wall plaster were used, costing \$3.75, and it took two men about three hours to build the box around the pattern, soap all surfaces, mix and pour the plaster and trowel down the surface. We had regular plasterers to do this work so the labor cost was high, coming to \$6.25. This made the total cost of matrix about \$10.00, or about \$0.0004 an acre.

Everyone, including the plasterers, expected this plaster to set in from 24 to 36 hours, but much to our surprise, it was two weeks before we dared remove the frame boards and lift the mold.

When we did lift the mold, it was all that we could hope or desire for it was practically perfect and very hard and smooth all around.

The Finished Relief Map.

With the matrix or mold completed it was a simple matter to make the final cast of the finished relief map.

A frame or box of clear, surfaced, two inch lumber was fitted closely around the outside of the matrix and carried up to a point about three inches above the highest point. The surface and form boards were given two or three coats of soft soap. The matrix was then accurately leveled and the plaster poured in.

Regular molding plaster was used and was mixed to a consistency of thick cream. Five gallon oil-cans were found good for mixing the plaster and about four gallons of

water were put in a can before any plaster was added. This plaster must be handled quite rapidly as it will begin to set in about ten minutes and will become quite hard in from twenty to thirty minutes.

In order to handle the plaster as fast as seemed necessary, we kept two or three buckets of plaster going all the time until the cast was completed. No trouble was experienced in getting a good bond between what was in the form and the plaster poured in from time to time, but we were particular to pour the plaster as rapidly as possible and did not let any batch in the form get hard before more was poured on top of it.

We used common lath for reinforcing, laying them about six inches apart all over and, then, pouring on more plaster, laid the next course of lath at right angles to the former course. This makes the cast very stiff, lightens it considerably and reduces the amount of plaster required.

The work of pouring for this cast was done late in the afternoon and took about an hour and a half for four men. The following noon we took off the forms and raised the cast from the matrix or mold.

The results were very satisfactory, the face being quite smooth, except for a few small air holes and these were easily filled with plaster mixed for the purpose. As an experiment, we dusted a little dry plaster over a small area—perhaps six inches square—and, after dipping the hand in water, rubbed it into the surface. The result was surprising for it made a soft lustrous gloss which was very smooth and made the cast most attractive in appearance. When the result of this treatment was observed, we finished the entire cast in the same way.

When the cast had become thoroughly dry, we seized it with shellac, painted it with common oil paints and mounted it. Three and a half sacks of molding plaster were used, costing about \$3.50. The labor of casting amounted to \$8.00; labor painting so as to show all streams, roads, trails, logging spurs, telephone lines, camps, burns,

green merchantable timber, natural meadows, agricultural land, etc., \$5.00; and the miscellaneous labor making frames, mounting and so forth, cost \$3.50. This aggregates \$20.00, making an average of \$0.0009 an acre. We could probably now make any number of these finished relief casts for \$20.00 each, or perhaps less.

Just a word here about handling molding plaster. We found that it was inclined to set on the sides of the buckets even while a new batch was being mixed. It also set on the hands and arms of those handling and mixing the wet plaster, so we made it a rule to wash the bucket and hands and arms after each batch was poured and before the plaster could take its set. This was for the reason that we did not want any dry chips to fall into the cast.

The completed map was displayed at the meeting of the Western Forestry and Conservation Association at Portland in October and was the subject of considerable favorable comment.

Since making the relief map described, we have made one out of concrete at a reduced cost and with excellent results. We also plan to make a third one with molding plaster face and back composed of one part of wall plaster to three parts of sawdust. This, we hope will be cheaper and lighter than the others and just as good.

While a relief map is not indispensable during the earlier development of a lookout, it has many advantages. When a chief fire-warden can sit at a telephone with a relief map before him, his grasp of the situation on the fire line, miles away, will be much better and will be reflected in more efficient service.

The value of the relief map to the timber land owner is even greater than to the timber protective organization, since it can be used for the basis of logging plans such as the location of roads, camps, logging spurs, chutes, flumes, trams and seven donkey settings. As a safe guide in the determination of the accessibility and cost of logging timber, the purchase of which is under con-

sideration and to association members like the state and land-grant railroads which have large holdings of timber that will eventually be marketed, it has a special

value. In other words it has all of the uses and values of a topographic map with the additional advantage that it can be understood by anyone at a glance.

Topographic Mapping

(I. W. Cook)

It is generally conceded that a topographic map is necessary before a complete working plan can be made or put into operation for logging, fire protection or grazing in the National Forests.

Timber companies are gradually having topographic maps made of their holdings for use in their plans for the reasons they are better able to:—

Plan a system of lookouts and determine the area visible from each.

Plan and locate trails and determine their grades.

Plan and locate roads, railroads, chutes and flumes and approximate all grades and curves.

Plan the main lines and spurs and the minimum amount of railroad to serve the area.

Determine the natural logging units.

Determine the system best adapted to each unit.

Approximate the cost of improvements and cost of logging.

Choose the best route to send men and supplies to a fire.

There is now an unsettled opinion as to the best methods of taking topography and the required intensity and exactness of the work. We find a great variety of systems and maps made, some making very cheap crude maps, others very expensive detailed maps. Formerly only cheap rough maps were made which have often proved unsatisfactory because of their inaccuracy and the intensive requirements placed upon them.

The present tendency is to swing to the other extreme and make intensive maps which are often unnecessarily expensive so

far as the purposes required of them. In many cases such maps will not meet the requirements of exact paper locations for railroads, trails, chutes and flumes, which are often claimed for them. The cost of a map covering the whole area by which such locations could be made would be prohibitive because of the intensity and accuracy of the survey required to show accurately the detail of the surface features in timbered and mountainous country. Such detail and exactness would not be necessary for the area outside of the immediate location of improvements, and if made would be a useless and extra expense.

What should be required is a moderately accurate map, showing the general detail so that the possibility and general routing of roads, etc., may be determined, leaving the exact location for a field survey. If a paper location is desired as in standard railroad building an intensive topography map can be made along the route without the great expense of covering the rest of the area.

The danger of the present tendency is to spend too much money on maps and make too great claims for them which they will not fulfill when put to the test, causing a revision of the general favorable demand for them. On the other hand often rough and cheap maps are made for fire protection purposes of country which will later be logged. These may answer the purpose splendidly for fire protection but are inadequate for logging plans, for flumes, chutes and railroads and when these requirements come up will necessitate a new survey. In such a case a slight extra cost

and a better map are warranted above the immediate demands. It is foolish to cover the areas of unmerchantable timber outside of the immediate location of exploitation improvements where the map is to be used only for fire control or grazing with the same degree of detail as the timbered areas. A proper balance should be made between cost and requirements and possibilities of topographic maps.

A good control to which to tie the detail should be the basis of all maps. This does not mean the refinements of spirit leveling or the rough aneroid barometer determinations, but by trigonometrical leveling by good hand instruments or transit, using care that everything is measured accurately and no estimated shots or distances used. Careful ties should be made and small errors carefully balanced. Large errors should never be balanced but the work corrected by resurvey. Such methods cost but little more than the rough methods and generally save more than the extra cost in eliminating later adjustments of topography.

The next step of developing the detail work will depend upon the use and the nature of the cover and topography. On grazing areas the use of the traverse board and clinometer will give the desired detail and accuracy with the minimum cost. On timbered areas the gridiron system with

strips ten chains apart give the necessary accuracy for timber exploitation plans. This system fits the common method of cruising and can be run simultaneously to an advantage. Strips 20 chains apart are sufficient for mapping for fire protection purposes. Both should be run with some form of a trigometrical leveling instrument, preferably an abney hand level, altho under good climatic conditions with proper ties and checks with a camp biograph, good fire plan maps can be made with an aneroid barometer.



AN OLD SONG RESUNG

Come join my humble ditty, from Tippery town I steer,
 Like every up to date gazook, I take my grape juice clear,
 Like every honest stu-di-ent, I take my ginger beer—
 I'm a delegate from a bone-dry state, the son of a chandelier.

I wish I had a barrel of milk, and sugar, three hundred pounds,
 The college bell to shake it in, and the clapper to stir it round—
 I'd drink the health of William J., and bid him never fear—
 I'm a regular whizz with a chocolate fizz, the son of a chandelier.

S. R.

THE PLAIN HUMAN.

Seasons of snow, and seasons of flowers,
 Seasons of loss and of gain—
 Since grief and joy must alike be ours,
 Why do we still complain?

Ever our failing from sun to sun,
 O, my intolerant brother:—
 We want just a little too little of one,
 And much too much of the other.

JAMES WHITCOMB RILEY.

Young couple in a restaurant. Young man as waitress arrives: "Have you mushrooms?"

Waitress, blushing, "Pardon me, I thought you were married."

EDITORIAL

OUR ANNUAL

In this, the first independent publication of the Forestry Club so far attempted, the editors have tried to create a booklet containing considerable information which will be of interest to men engaged in forestry work and at the same time reflecting the spirit and condition of our school. If, after reading this annual, the friends of the Forestry School have a clearer and better conception of what the undergraduates are striving to do and what the School is doing to help fit these men for the work that is before them, our main object will have been attained.

Most of the subject matter of this booklet and all of the labor incidental to the editing and publishing has been furnished by undergraduates of the Forestry School. At the same time, we must offer thanks to such friends of the School as James R. Weir, and C. I. Woods, who have very generously contributed the signed articles which appear in this annual.

THE ASSOCIATED FORESTERS

All of the students of Forestry, whether short-course or long-course are members of the Forestry Club. This club meets every Monday afternoon and at this time all business matters are brought up and disposed of. After the regular business meeting, a short time is given to reviewing articles from current periodicals or other matters of special interest.

Several activities of interest were handled under the auspices of the Associated Foresters during the year just passed, the most important being the Annual Banquet, and the "Timber-Beast's Hoe-Down."

THE BANQUET

The Annual Forestry banquet was held in the dining room of the Moscow hotel, Tuesday, Dec. 12th. Not wishing to hang any blue ribbons upon ourselves we will be content to say merely that this was by far the most successful feed ever engineered by our club and we hope that the same standard of excellence will be maintained in the future.

Dr. Shattuck presided as toastmaster and after the meal some very cheering and encouraging words from guests and alumni served to put everyone in just the right humor. A short musical program consisting of piano and violincello solos and culminating in the rendition of the Foresters song by the crowd ensemble, helped to make the evening pass most pleasantly.

About fifty places were set. Besides the members of the Forestry Club, there were present a number of our friends from the faculty and other friends of the forestry school. Mr. Ben E. Bush; Mr. Charles Fisher, State Land Selector; Mr. W. D. Humiston of Potlatch and Dr. Melvin A. Brannon were among our guests.

THE BIG HOP

Saturday, February third, was the date of the big affair. Just imagine yourself after a hard week of examinations standing this eventful evening on the edge of the campus, looking nonchalantly in the direction of the Gym. A few strains of banjo music drift across the snow. All is calm. Suddenly, a wild clamor breaks loose; wild cries and shrieks are heard coming from the Gymnasium; pandemonium rules supreme. Breathless you dash across the campus and tear open the door. There, circling and whirling, whistling and howling is the whole population of the University,

happy and free from care. The fantastic garments; the gingham and calico over there and the bandanas and stag shirts here, explain it all. This is the Timber Beast Hoe-Down.

If you cannot imagining this much, you cannot begin to realize what the Foresters dance really was. From an esthetic standpoint it may have fallen below some of the fine dances that have been held here this year but, from the standpoint of a really good time, it could not be beaten.

TIMBER BEAST HOE-DOWN

FIRST ANNUAL DANCE

Given By

ASSOCIATED FORESTERS

University of Idaho

Feb. 3, 1917.

Logs	Species	D.B.H.
1		
2		
3		
4		
5		
6		
7		
14		
15		
16		
Miscellaneous Dead & Down.		
1		
4		

PHI BETA ALPHA

During the fall of 1915, some of the upper classmen of the Forestry School conceived the idea of creating an honorary fraternity for forestry students. Acting on this idea the Phi Beta Alpha fraternity was formed later, that same year. The requirements for membership as then outlined

were these: first, the student must be a member of one of the two upper classes and must have a first class and honorable standing in the same; and secondly, he must have a record of at least two successful summers in some branch of forestry work.

Strictly speaking, this is not a purely honorary fraternity but its scope is such that all of the benefits of an honorary may be secured and at the same time other results for which it was created may be realized. The aim of this organization is not only to give students something to strive for but to build up a stronger tie between the undergraduates and the alumni of the school. It is probably in this latter field that Phi Beta Alpha will be able to do the greatest and most lasting good for the School of Forestry.

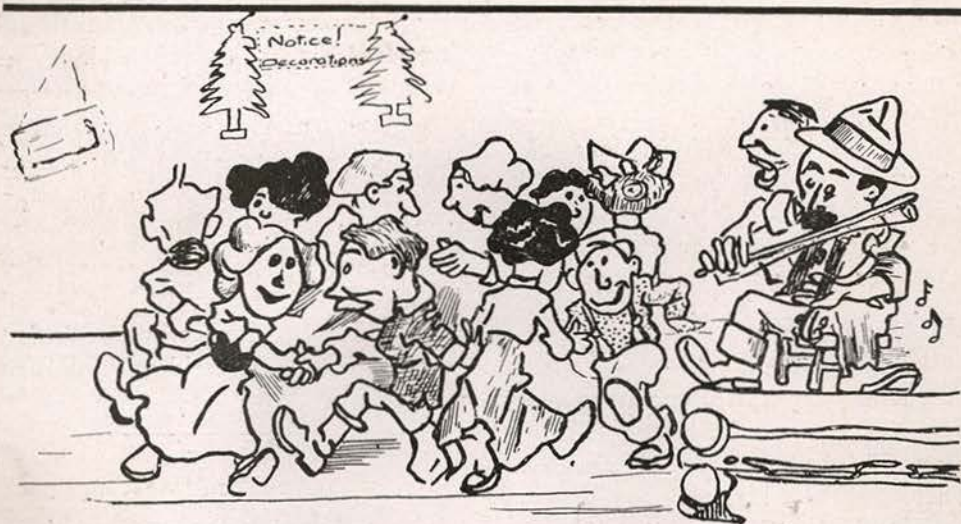
Phi Beta Alpha is intensely interested in all matters pertaining to forestry or connected in any way with the Forestry Club and centers its efforts on supporting and attempting to better the Forestry School. There are about fifteen active men connected with the fraternity at this time and the membership is constantly growing. All in all it is quite a potent factor in helping to guide the interests of the department and in maintaining a close cooperation between alumni, students and faculty for the purpose of making a bigger and better school.

THE LOGGING CONGRESS

The Western Forestry and Conservation Association and the Pacific Logging Congress held their annual meetings at the Hotel Portland, Portland, Oregon, October 24-28. Nearly 500 were present and the meetings as a whole were very successful. Hugh Swan, D. H. Yates, O. C. Munson and R. N. Cunningham, four undergraduates of the Forestry School and Professor Cook represented the Idaho University at these meetings.

Prominent Men Present

Tuesday and Wednesday were given over to a Forest Industry Conference and



LUMBERJACK HOE DOWN—Feb. 3

the Conservation meeting in which Foresters of the federal government and lumbermen from the Northwest and from Canada met to discuss the needs of their industry, and to compare notes on the progress of past year. Some very interesting papers were read by such men as W. B. Greeley of the Forest Service; M. A. Grainger, Chief of the British Columbia Forest Service; Dr. Edward Ewing Pratt, Chief of Bureau of Foreign and Domestic Commerce; E. T. Allen and others.

The Pacific Logging Congress met Thursday and Friday. Following this meeting, the congress was conveyed by special train to Hoquiam, Washington, where it was the honor guest of the Polson Logging Company and of the other Grays Harbor loggers and lumbermen.

Encouraging Schools

The most significant thing in these meetings from a forestry school's standpoint was the expression by the lumbermen of a need for technically trained men in their business. Some of these men were quite outspoken in their denunciation of the slip shod methods that have been in practice in the logging world and expressed their belief that the time has come when this industry should be inoculated with a certain amount

of new blood in the way of men with special technical training along proper lines.

INTERCOLLEGIATE ASSOCIATION OF FORESTRY CLUBS

The Intercollegiate Association of Forestry Clubs was founded at Cornell in the spring of 1914, the object being to encourage good fellowship among the students of the different forestry schools over the country and to create interest in scientific forestry. Any school offering a regular course in forestry is eligible for membership in this Association and at the present time about twenty-five colleges are represented.

Meetings are held each year the policy being to alternate the place of meeting between the East and the West. No convention was held in 1915, but on January 28 and 29, 1916, the first convention after the founders' gathering was held at Ann Arbor, Michigan. Eight forestry clubs were represented at this meeting. At this time the delegate from the University of Washington very courteously consented to propose for membership the name of the Idaho Forestry Club. Whereupon it was admitted into the Association. Several important business matters were handled at this meet-

ing among them; the adoption of a constitution, the matter of a publication, of Junior membership in the Society of American Foresters and of a National Honorary Forestry Society.

The Seattle Convention

The second convention was held this year, March 1, 2 and 3 at Seattle, Washington, under the auspices of the University of Washington Forestry Club. This meeting was a very successful one from every standpoint. It was a far larger gathering than any which had preceded and the treatment accorded the delegates by the members of the Washington Club was exceptionally fine. Thirteen schools were represented by delegates at the Seattle meeting, namely; Michigan, Yale, Syracuse, University of Montana, Berkeley, Washington University, Pennsylvania State College, Mont Alto Forest Academy, Iowa State College, Missouri University, Oregon Agricultural College, and the University of Idaho.

Association Publication

The most important matter of business brought up at this time was in connection with a publication for the Association. After considerable discussion, this body decided to edit a booklet to be printed annually and to be distributed among the forest schools of the country.

Sight-Seeing Trips

After business matters had been attended to, the delegates spent the remainder of the time seeing some of the wonders of the Northwest in the way of great lumbering and milling operations. Many of the interesting places at and near Seattle were visited and several excursions to other nearby towns helped to make the convention a very enjoyable one to the visitors. One day was given over to the inspection of the Weyerhaeuser Electric Saw Mill and the plant of the Everett Pulp and Paper Company at Everett, Washington; while another day was spent in the woods

near Stillwater where some of the giant Coast Red Fir was being logged.

Next Meeting at Yale

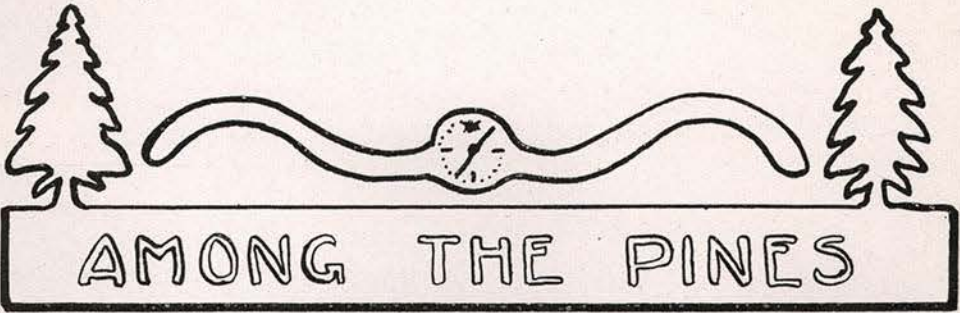
The Convention closed Saturday evening with a banquet given by the University of Washington Forest Club in honor of the visiting delegates.

The next meeting of the Intercollegiate Association of Forestry Clubs will be held at New Haven, Connecticut, Yale having been chosen as the President School for the next year.

Supervisors' Meeting

A meeting of 26 Forest Supervisors of District I was held in Missoula early this spring. Many important matters were discussed at this time, such as, fire protection, timber sales, telephone, trail and road construction, silvicultural problems, etc. The problem of livestock grazing on foothill types of north Idaho and Montana, occupied the center of the stage for a considerable time at this convention and the interest of most of the Supervisors concerning this subject is thoroughly aroused.

Dr. Shattuck, who attended the latter part of the convention outlined to these gentlemen what some of the University men had been doing in the way of solving such problems in the southern part of the state and expressed the belief that the same excellent results could be obtained upon many of the forests of this region. In conclusion he described the course in "Grazing" which is being established at the University for the coming year. The supervisors expressed their unqualified approval of this course of study and of the work that the Idaho men have been doing in District I. It is to be hoped that a close cooperation between these foresters and the University may be maintained in the future, thus making it possible to turn some of the waste range of this district to better advantage.



The Forestry Club had a roll call of forty, this year.

The Honor System has been successfully used in the School of Forestry for two years.

The herbarium now available to the students of this department consists of some-thing over 2000 plants.

For use in the course in Wood Technology, we have an assortment of Philippine, Indian and other tropical woods. Some very rare and beautiful specimens are in this collection.

Moody and Ruckweed are carrying on experiments near Troy, this spring, designed to determine the value of the topographic map for location of railroads.

Homer Youngs, '15, has given up forestry work to join the army. Homer is the third Idaho forester to get the military fever after graduation, Herbert Wadsworth, '10, and Fritz Carleson, '15, being commissioned officers of infantry at this time. Youngs was Grazing Examiner for District I last year.

Leo Morris, '16, is a pretty busy man as Assistant Land Agent for the Potlatch Lumber Co. As someone expressed it: "He runs a Twin-two jitney all summer and a twin-six job all winter."

Tom Jackson and Don Yates are busy whipping a party into shape for the sum-

mer's work. Each is to have charge of a crew on topographic mapping, Tom working for the Clearwater Protective Association and Don for the Potlatch.

Oscar Munson who, for the first time, is to fill the position of warden for the Potlatch Association, this summer, has but one worry. He is afraid that the snow is going to be too deep to allow him to exercise his skill at fire control. No one would accuse him of worrying about the I. W. W.'s.

Tom Lomasson who so seriously injured his foot last summer, illustrated his complete recovery by proving himself to be the lightest man present at the Lumberjack's Ball

Three lady foresters are enrolled in the class in General Forestry, conducted by Dr. Shattuck.

Arlie Decker, who is spending a year at Yale, stopped off at Washington, D. C., on his way to Louisiana for "spring camp," and attended the inauguration of President Wilson. He had the distinct honor of being allowed a seat on the President's platform during the ceremony.

Some of the lady foresters of the General Forestry class are preparing a map of the University campus, showing the location of all trees and shrubs.

Harry Malmsten is making a study of the grazing conditions on the headwaters of

the South Fork of Palouse creek, south of Moscow.

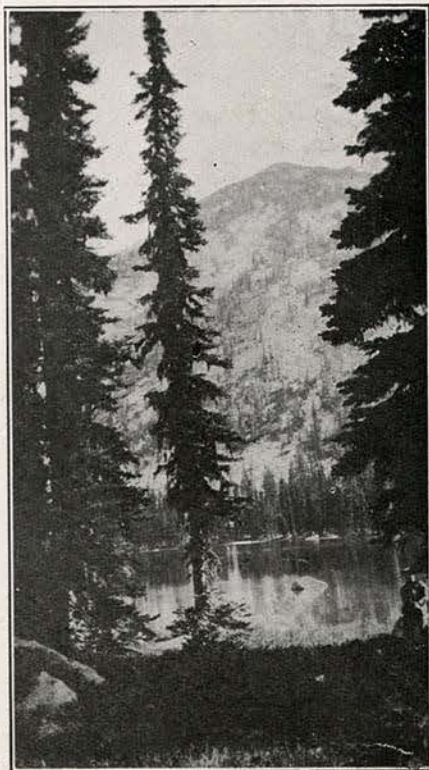
A bulletin recording the results of extensive experiments with stump-wood distillation, carried on in the University laboratory by government experts, will be ready for distribution, very soon.

Dr. Shattuck is planning an arbor-cultural experiment in which he will graft a scion of a Japanese weeping elm onto the common American elm. Some of these fancy Japanese elms have been growing well in the arboretum and it is expected that this cross will produce a tree quite hardy as well as ornamental.

The regular spring camp which was scheduled for the first week in April, had to be postponed on account of inclement weather conditions.

A windbreak of hardy pines and firs has been planted between the Gymnasium and the Administration building to moderate the prevailing westerlies which sweep across the campus.

A catalogue of trees which may be had from the Forestry department at cost will be mailed to anyone in the state upon application.



Some Points to Remember in Marking and Cruising Grand Fir and Hemlock

(JAMES R. WEIR, Forest Pathologist.)

No other timber trees of our Idaho forests are more subject to fungous diseases than grand fir and hemlock. In some regions these species are also badly suppressed by mistletoe, the cankers of which afford an entrance to the spores of wood-destroying fungi. The expression "fungous diseases," when applied to these species, includes a number of needle diseases. This means, of course, reduced increment, and if the attack is continuous, rapid death or slow starvation may re-

sult. There is more of this kind of injury in the case of grand fir and hemlock than the unpracticed eye may perceive. It is our purpose, however, to consider the wood-destroying fungi, since they affect the present timber capital.

The chief enemy of grand fir and hemlock is *Echinodontium tinctorium* E. & E., a hyndaceous fungus principally of north-western distribution. The fungus is only of importance in the consideration of the problems relating to the genera *Abies* and

Tsuga. Its occurrence on other hosts is extremely rare. Few other wood-destroying fungi are contemporaneous with *Echinodontium tinctorium* on grand fir and hemlock. The chemical action of the fungus seems to be somewhat toxic to the mycelia of other species. *Trametes pini* (the ring rot fungus) has been noted to die out on parts of grand fir and hemlock later encroached upon by this fungus. The opportunities for eradicating a fungus with such marked predilections for definite conditions are far greater than in the case of cosmopolitan species.

The active fungus proper is the mycelium in the wood, not the "conk" without. The mycelium may be in any stage of development at the time of cutting, which later determines its activity in the wood if the tree is cut or left standing in the open. The appearance of the fruiting body of the fungus is an index of mature mycelium at least within a certain area of the infected host. It means that nearly all the food materials of the heartwood at that point are practically exhausted. Since the mycelium can not attack actually living tissues or even wood not having undergone certain chemical or physical changes, it does one of two things, usually both, viz, reproduces itself by means of sporophores or extends longitudinally in the heartwood. This longitudinal extension occurs in the central heartwood of grand fir and hemlock, and the stem analyses of several hundred trees in northern Idaho have shown that its effects are perceptible in many cases throughout the merchantable portion of the tree. When marking, the points to consider are these: A tree bearing a single average-sized sporophore, etc., also indicate much of value in determining the merchantability of the tree), situated, let us say, on the first sixteen feet of the trunk, may, for all practical purposes, be taken to indicate an unmerchantable condition of the heartwood of all points below and for the next sixteen-foot log above the first. Owing to the

rapid development of the mycelium of the fungus, a sporophore situated well up on the trunk may be taken to indicate undesirable material through the main part of the trunk, unless, as under some conditions, the rapid rate of growth in the tree has counteracted the advance of the fungus. Nothing need be said concerning the presence of more than one sporophore. It will often be observed that the largest sporophore has smaller marks above and below it. This usually indicates that the largest sporophore marks the point of first or original infection and that the decay has traveled both ways but more rapidly upward. In any case, trees bearing more than one sporophore situated some distance from each other are not merchantable.

The presence of sporophores of *Echinodontium tinctorium* on grand fir and hemlock is an indication of a fairly advanced stage of decay throughout a good portion of the tree. On the other hand, the absence of sporophores does not always indicate soundness. A few cases may occur where the tree is so old in decay that the sporophores have died and fallen away. The discoloration of the bark at the point of attachment or of the hole left by the rotting branch may be readily noted. The old sporophores, which have a remarkable resistance to decay, may be observed at the base of the tree. Pounding on the trees is a fairly accurate method of determining soundness, down to a particular stage of rot. In doubtful cases, assuming that the tree is of merchantable size and is to be cut, remarkably accurate results may be obtained by chopping off a portion of the bark and pressing the ear firmly against the tree. This method secures an uncushioned sounding point on the tree to be tested. Considerable practice is required, but unsound heartwood in initial stages of decay may often be determined by this method, whereas a stroke upon the trunk, the woodsman standing some distance away,

may be misleading. A heavy blow is not necessary on the bare wood with the ear against the trunk. A sharp metallic ring of a particular resonance which the practiced ear will learn to interpret is transmitted by sound wood. The great difference between the two methods of pounding may be illustrated by the tone given out by a watch when held to the ear and when held at arm's length.

In scientific work the increment borer of And. Mattson, Mora, Sweden, is of great service in determining the soundness of trees. This is the only increment borer on the market which will cut a smooth core rapidly and neatly without breaking or contorting the wood. This borer may be had in various sizes.

Owing to the cortical parenchyma of the bark multiplying just about rapidly enough to keep up with the increased growth in diameter, consequently retaining the epidermis until late in life, grand fir does not usually show any characteristic roughness of bark induced by fungi. It is frequently noted, however, that badly infected trees of the older age classes, owing to their reduced vigor, allow the dead bark to accumulate forming deeper clefts between the bark scales and darker bark due prob-

ably to a greater growth of algae and lichens. It is believed that the practiced eye may learn to distinguish healthy trees by the clean looking, greenish-white appearance of the bark of the main trunk, by the general picture of a well nourished condition, and by the absence of large dead branches, etc., to practical work in the field. Probably the most practical method for the average marker in the absence of visible defects is the presence of a red color a half inch or so within the exits of the dead branches. The reddish coloration of the rot of *Echinodontium tinctorium* is an index of an advanced stage and its appearance so far out as to be detected by merely breaking off the dead branch is a sure sign of the typical rot within. The red color may not show at the base of every branch, in which case several may be examined. If the red color does not show after the knot has been opened with the corner of the axe, the branch may still show a yellowish dry rot; the usually flinty consistency of a naturally pruned branch has given way to a loosened condition of the annual rings. This may be taken to indicate an initial stage of the rot. Knocking off a few dead branches with the axe does not require much time and is a very good method to use.

SPECIAL LECTURES

The Forestry School was very fortunate this year in being able to secure the services of Mr. Mark Anderson of District I and Mr. Charles McHarg from the Coeur d'Alene forest for a series of lectures on forestry and grazing problems.

Mr. Anderson, in four very interesting talks outlined the grazing situation and other phases of National Forest work of the present day and described a few of the problems which are about to face the Forest Service in its rapid development.

Recreation On Forests

The use of the National Forests for recreation purposes is becoming more and

more important every year. On many of the forests, the officers are encouraging travelers to visit scenic spots within the forest and are doing all within their power to make things pleasant for visitors. The policy of making moving picture films, showing some of the scenic spots of the forest and the activities of the forest officers has been inaugurated in at least one District, with the idea of advertising the recreational aspect of the National Forests and of creating a general interest in the work of the Forest Service. Mr. Anderson showed one film which had been taken of the Sevier Forest in Utah. This picture was especially interesting to the Idaho

boys as it showed some of their number "in action" as they had appeared the summer before in grazing reconnaissance work.

The lectures on grazing, including Carrying Capacity studies, forage utilization and allied problems were of exceptional interest.

FIRE PROTECTION IS DISCUSSED

In the few days that he was here, Mr. McHarg gave a number of very interesting lectures on widely diversified subjects. The fire protection problem as handled by some of the north Idaho forests was first taken up and many of the new wrinkles in fire control as well as the most up-to-date methods in protective administration were explained to the forestry boys. Fire protection is being worked down to a science in District I and it is certainly encouraging to note the great progress that has been made along this line since the great fire season of 1910.

Mr. McHarg has done considerable experimental work on marking of white pine and his talks on this subject were extremely instructive as well as interesting. There has been no end of argument over what are the best practices in this matter. It is admitted that wherever a hard and fast rule for marking, based on a few scattered experiments such as a strict diameter rule is laid down for a whole region, very unsatisfactory results will be obtained. The marking plan outlined by Mr. McHarg proposes to allow the officers in charge of the sale a wide degree of latitude in choosing what trees to cut, that is let them use their judgment in the matter in so far as it does not conflict with the general policy of the sale. In this way a marking plan can be made adjustable to a number of types and conditions and at the same time the forest can be handled more successfully from a silvicultural standpoint. The forest school will be interested in seeing how such a plan will work out.

THE WHITE PINE BLISTER-RUST

Expert investigation has established the fact that the white and other five leaved pines of this country and of Canada are threatened by the White Pine Blister, (*Cronaetium ribicola*) a fungus disease imported from Europe. This disease has already been extensively found in New England and in some of the other Eastern States and the infected area is constantly spreading. So far, none of the western trees have been affected and the problem for Idaho, for the present, is that of keeping out the disease. How this should be done and what steps should be taken to eradicate the fungus where it is established, was outlined at the International Forestry Conference of the American Forestry Association held in Washington, D. C., early this year.

The requisites for control of this disease are briefly as follows:

(1) A federal quarantine preventing shipment of white pines and all current and gooseberry bushes to states west of the Mississippi.

(2) A state quarantine preventing importation of pine trees or currant or gooseberry bushes from the infected states. This has been done in Idaho.

(3) Authority to proper officials to see that all trees or bushes infected with this disease or in danger of becoming infected are destroyed.

(4) The cultivated black currant should be declared a pest and should be totally destroyed.

The action in regard to currants and gooseberries is explainable by the fact that this rust belongs to the type of fungus, which to complete its life history, must pass thru different generations on different hosts. In this case, the alternate hosts are the pine and a plant of the genus *Ribes*.

Evidently the carrying out of these plans will require the complete cooperation of all of the citizens of the state. Surely the problem in Idaho is a large enough one,

and the interests at stake sufficiently great, that no pains will be spared and no precautions overlooked to keep out this pest which threatens our timber.

Methods of Clearing Logged Off Lands in Idaho

According to the 1916 assessment rolls, there are about five times as many acres of cut-over land in private ownership lying idle as are being cultivated in the four counties of Kootenai, Bonner, Boundary and Benewah and about the same ratio prevails in several other of the northern counties of this state. In addition to this the state owns more than a million acres in north Idaho which must be cleared of stumps before it can be farmed. Much of this land is extremely fertile when cleared and cultivated but because of the excessive cost and amount of labor required due to improper methods of clearing the advance in this work has been slow. With the passage of the Kent bill thru the legislature which provides assistance from the state in the way of creation of bonding districts similar to the procedure now followed in southern Idaho in connection with irrigation lands, the interest of prospective settlers is again centered on the undeveloped cut over land of north Idaho, and on the methods of removing the stumps.

Experiments in Blasting

In the autumn of 1911 the Forestry Department of the University cooperating with the Potlatch Lumber Company carried on some rather extensive experiments designed to determine the cheapest and most efficient methods of removing stumps. The results of these experiments have just been published in bulletin form and can be secured from the University.

Mr. Herbert A. Wadsworth, a senior in the Forestry Department was chosen to supervise this work of land clearing and he most ably performed his duties. The site selected for the operations was on level bottom land in the valley of the Palouse river. The soil is classified by the U. S. Bureau of

Soils as Potlatch Silty Clay Loam and is underlaid with a hardpan formation at an average depth of about three and one-half feet. It had been covered with a dense stand of Western Yellow Pine, Red Fir and Larch in about equal proportion. The pine had been cut eight years while the fir and larch had been removed more recently.

Working plots of five acres each were carefully selected with the view of securing representative cut-over land and each was handled in the same manner as regards preliminary work, the making of holes, piling and burning of logs, brush, and stumps and the leveling of the ground after all of the clearing work had been done. The only differences were the methods of removing the stumps from the ground. Thus a very fair comparison of the various methods was obtained.

The following seven definite steps were taken in order to complete the work on each plot:

1. All brush and unsound logs, limbs, bark, etc., were put into piles for burning.
2. Stumps were identified and measured as to height and diameter as well as condition.
3. The root system was examined and the condition recorded. The holes were bored.
4. The stumps were loaded and shot, the amount of powder used and the manner of firing being recorded.
5. The stumps were piled preparatory to burning.
6. Debris of all kinds was burned.
7. The holes were filled and the ground leveled.

Results

As a result of these experiments the University secured some very valuable in-

formation as to the best methods of blasting, the best materials to use and a very fair estimate of the cost per acre for land clearing.

Costs

The cost of clearing the sample areas ran from \$109.50 to \$126.73 per acre. This cost is not likely to be exceeded for similar areas in this region as the plots selected were very heavy and all labor and materials

are included in the cost data.

In estimating cost this rule will hold fairly close.

Cost of Labor

Multiply the total number of feet diameter of stumpage by 4-10; the result will be the cost in dollars.

The following table shows the amounts of various powders found necessary for stumps of different diameters.

Rounds of Powder for Various Stump Diameter.

DIAMETER IN INCHES	6	10	12	14	18	24	40	56
20% DuPont Stumping Powder L. F.....	.6	1.2	2.	2.5	3.1	5.3	11.9	17.5
Jexite Blasting Powder	0.7	1.2	2.	2.5	3.3	5.5	12.0	17.5
20% Vulcan Stumping Powder28	.80	.84	1.4	2.1	3.9	.7	

From this table it will be seen that the Vulcan stumping powder has many things to commend it to the farmers, and when all things are considered, it is beyond doubt the most efficient method of clearing land yet devised. Further experiments with blowing and cracking stumps in this section have born out this conclusion.

Methods Employing Fire

A great many methods of removing stumps with fire have been worked out with varying degrees of success. In general, those which work from the inside, out have been the most successful. Various ways of getting at the center of the stump have been employed, such as boring, sawing and splitting with dynamite.

It has been found that when a stump is sawed off at the level of the ground and then elevated from two to four inches on wooden skids and allowed to dry out, it burns well. The fire when well started is covered up with sod or dirt and will burn until the roots are practically all consumed. This is one of the best and cheapest methods for removing stumps of red fir and yellow and white pine. Laborers in north Idaho are contracting to remove stumps by this method at forty and fifty cents a stump for all stumps over eighteen inches and are said to make fairly good wages and are clearing the land at a cost of from \$10 to \$25 an acre.

From time to time efforts have been made to combine wood distillation with the operation of removing the stump by means of fire. On the whole such efforts are as yet only partially successful and it is doubtful that they will ever come into very general use. The Department of Forestry has done all in its power to assist those who have made efforts along this line and has devised several forms of condensers for use with hoods. It has also furnished money and equipment for experimental work of this kind carried out near Moscow by a representative from the Bureau of Chemistry. These results are in the hands of the department at Washington, D. C.

The principle involved is that of the condensation of the volatile substances driven off in the slow charring of the wood. The simplest condenser yet devised, namely a straight iron pipe was very successfully used by Mr. Jos. Hougau, of Potlatch, Idaho, who after viewing our experiments carried on at Viola, used such a condenser in collecting several hundred gallons of liquid. Mr. Hougau did not even use the hood but attached the pipe which tapped the fire chamber directly to the stump.

From the tarry portion of the liquid, Mr. Hougau manufacture several kinds of cheap paint and he also used it to impreg-

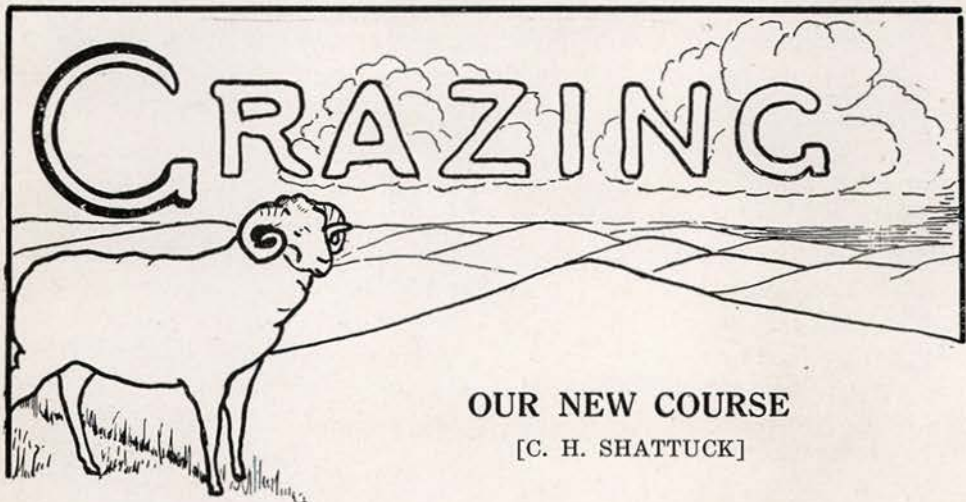
nate fence posts. The latter use is probably the most practical to which it can be put.

Mechanical Stump Pullers

In addition to the methods outlined above there is a large number of mechanical appliances on the market designed for removing stumps. In this class will come the various fulcrum and lever systems, the capstan puller, the tripod vertical puller and various forms of tractors and stationary engines. Most of these machines are designed for pulling the smaller stumps

and are somewhat limited as to the kind of country in which they can operate. A few have been successfully operated in north Idaho and others are being experimented with at the present time.

It must be remembered that no one method of land clearing can be recommended under all conditions as superior to the others. Each has its advantages and disadvantages depending on the conditions under which it is to be used and a thoro study of these conditions in each case should be undertaken before any attempt is made to clear the land.



OUR NEW COURSE

[C. H. SHATTUCK]

For a number of years the demand for young men trained in the various branches required for work in the great industry of Grazing has been increasing. At the present time this demand is so large, the calls for men are so numerous, and the salaries offered such an inducement that the Department of Forestry feels justified in inaugurating a special four-year course devoted wholly to training young men for this vocation.

The problems of Grazing Management, Grazing Administration and Carrying Capacity are large and involve millions of acres of pasture lands, as well as great values in the various classes of live stock on the same. An exact and scientific

knowledge of the range—its topography, its plants, its rainfall and general climatic conditions—is an absolute necessity in settling any practical working plan for the future. Proper methods of handling stock, the various kinds of stock suitable for different kinds of range, the time such stock should be placed on any range and the proper time to remove the same, are all matters of great importance and are now being clearly and definitely worked out for each National Forest and for large areas of the Public Domain now under grazing. Such vital problems as water development on the range, proper methods of rotation for different classes of range, the elimination of poisonous plants, the eradication of

predatory animals, when and where certain classes of range should be favored by deferring the grazing until the seed has matured and whether or not certain lands are over- or under-grazed, are constantly confronting the forest service officials and the stockmen.

As the Science of Agriculture has greatly increased the productivity of agricultural lands, so will the scientific study of the problems affecting our grazing lands greatly increase their productivity. These lands have been sadly misused in the past as have also portions of our farm lands, but it has already been clearly demonstrated that they, like the farm lands, can be made to respond in a most decidedly favorable manner to scientific methods and sane prac-

tices. The ever increasing prices of beef, mutton, wool, and all other animal products demand that the old crude methods of handling the range and range animals must give way to methods more refined and scientific.

This work will demand the services of many young men trained in Grazing. It will require several years to complete the preliminary reconnaissance work alone. After this is done each forest will need a grazing expert permanently in residence, and extra men to carry on the various lines of experimental work dealing with the tremendous grazing problems of the country which are as yet untouched and are of the highest economic importance. Young men acquainted with the live stock business are especially well fitted to take this course.

CURRICULUM IN GRAZING

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
English Literature	2	English Literature	2
English Composition	1	English Composition	1
Freshman Math.	4	General Botany	3
General Forestry	3	General Forestry	4
General Botany	3	Engineering Drafting	1½
Engineering Drafting	1½	Market types of Live Stock.....	2½
Drill	1	Drill	1
Regulations	1	Regulations	1
Total	16½	Total	16

SOPHOMORE YEAR.

First Semester	Credits	Second Semester	Credits
General Physics.....	4	General Physics	4
Systematic Botany	3	Systematic Botany	3
Surveying	4	Surveying	4
General Chemistry	4	General Chemistry	4
Forest Mensuration	3	Breed Types of Live Stock.....	2½
Drill	1	Drill	1
Military Science	1	Military Science	1
Total	20	Total	19½

Reconnaissance during this summer.

JUNIOR YEAR.

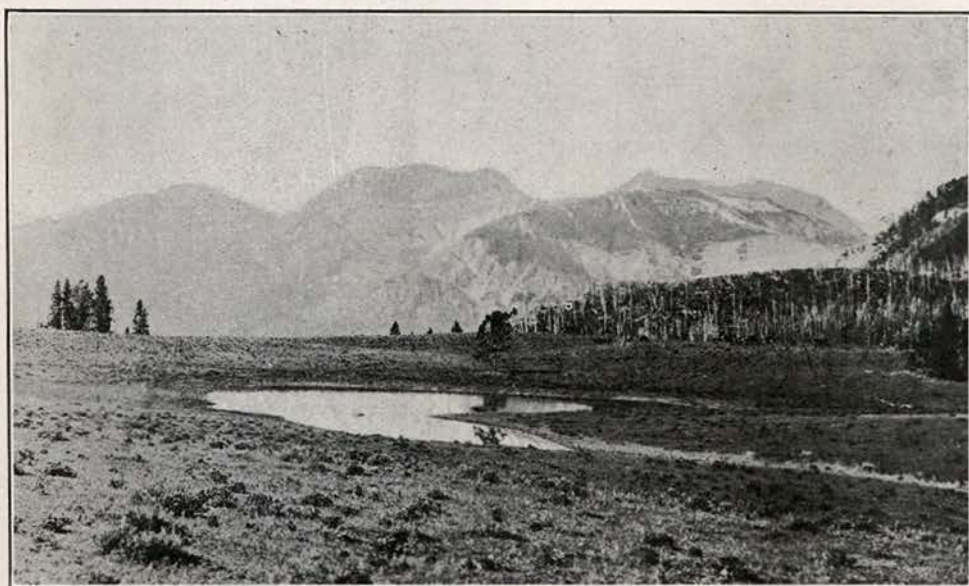
First Semester	Credits	Second Semester	Credits
Plant Physiology	4	Plant Physiology	4
Dendrology	3	Ecology	4
For. Engineering	3	Silviculture	3
Grazing	3	For. Engineering	3
General Geology	3	Forest Physiography	2
Stock Judging	1½	Grazing	3
Total	17½	Total	19

Reconnaissance during this summer.

SENIOR YEAR.

First Semester	Credits	Second Semester	Credits
Commercial Spanish	3	Commercial Spanish	3
Telephone Const.	1	Plant Pathology	2
Sanitary Science	1	Forest Entomology	3
Origin and Classification of Soils	2	Forest Management	2
General Zoology	3	Thesis	4
Forest Management	2	Grazing Administration	2
Forest Law	2	Range Management	2
Forest Protection	3	Total	18
Total	17		

Two season's experience a prerequisite to Grazing Assistant Examination



WATERING PLACE

THE 640-ACRE HOMESTEAD

The passage of the 640-acre Grazing Homestead Law on December 29, 1916, marks the opening of a new field for students

of forestry who are trained in the principles of grazing management as applied by the Forest Service.

Briefly, this new law provides that the

Secretary of Agriculture will designate for entry, lands which are chiefly valuable for grazing and raising forage plants, which do not contain merchantable timber, are not susceptible to irrigation from any known water supply and are of such character that 640 acres are reasonable required for the support of a family. An important part of the bill is the provision made for withholding water holes necessary in connection with the use of the remaining public range, and the withdrawal of stock driveways, necessary in driving stock to shipping points and to and from the range.

Each applicant for a grazing homestead, in order to obtain a preference on a piece of land may file an application in the local land office, accompanied by affidavits as to the character of the land. This, after the land has been classified, will give him the first chance at entry if it is found to be available under this act. No land can be entered until classification shall have been made.

It is in the classification of these lands and the setting aside of driveways and watering places that men trained in range management are needed. The work is being handled in the Department of the Interior and is directly under the supervision of the Geological Survey. The Forest Service has been asked to furnish six of the most competent grazing experts to take charge of the classification, and the crews will be assembled and the work started during the coming field season.

There is a large amount of public land, which will not be available under this law. This land is being largely overgrazed and poorly handled at present and its production is continually decreasing. It is very probable that, at some time in the near future, this land will be taken over and managed by this corps of experts under the Department of the Interior. This event would open a big field for the students of grazing.

H. S. Y.

OUR WEST

"Open skies
And bare, brown hills,
The hush of dawn,
The hour that thrills.

"A wind
That sweeps the desert clean,
And sweeps the heart
Of all that's mean.

"Mountain flowers
In hardy soil;
Blooming far from
Strife and toil.

"Down below
The orchards ripe.
The strolling sheep,
The newborn light.

"Sage brush
And the coyote's call.
A world that's free;
A place for all."

CAROLINE CLARK HINTON.

THE OLD CORK PINE

Straight as an arrow, clean of heart
Rugged and stout and strong,
Of earth and heaven above a part,
With a soaring soul of song
That sings however the storm may sear,
However the wind may whine—
Oh, that is the kind of a tree you are,
The pine, the old cork pine!

Straight as the pine, with a heart as clean,
Rugged and strong and stout,
The lowly earth and the sky between,
With a soul of song to shout
Above the storm like the swaying tree,
The king of a royal line—
Oh, that is the kind of man to be,
Like the pine, the old cork pine!



CATTLE GRAZING ON THE NATIONAL FOREST

The Importance of Range Management in Forest Administration

(C. H. Woods, Inspector of Grazing.)

The part of District 4, in Idaho embraces the south part of the State and includes thirteen National Forests. The importance of the forage crop on these Forests is indicated by the number of stock authorized to graze during the season of 1915, viz., 120,000 cattle and horses and 1,617,000 sheep, in round numbers. The value of this amount of stock at current prices is approximately \$15,000,000. The numbers given do not include young stock under six months of age at the opening of the grazing season. The National Forests furnish range almost indispensable to stockmen during the hot, dry summer months when ranges outside the Forests and usually at much lower elevations have an inadequate water supply and when the forage at the lower altitudes is much less succulent.

Since the Forest ranges are so valuable to stockmen and in so great demand, the great importance of range management being such as to allow the greatest forage

utilization possible, having in mind maximum and continued production of the forage crop with proper protection to timber and watershed, is obvious.

The number of stock a certain acreage of range will properly carry for a given length of time depends on many factors. Chief among these may be mentioned: class of stock, climatic conditions, watering facilities, topography, soil, plant species, forage acres, date in spring when grazing season opens, and method of handling stock. Different classes of stock, by nature, choose different plants. Cattle and horses are particularly fond of grass, while sheep prefer certain weeds and browse. Cattle, when grass is scarce or wanting, will eat a number of species of weeds and shrubs, Range plants other than grasses are less palatable to horses than to cattle.

Topography, alone may decide whether a range is to be grazed by cattle or sheep, as a country too steep for cattle may comprise a good sheep range. Plants, poison-

ous to cattle, may be grazed by sheep and eaten by that class of stock with impunity. Some species of larkspur are examples. A range poorly watered, even if stock graze all parts of it from water, is never uniformly utilized, the heaviest grazing being nearest the watering places and much of the forage is wasted in the movement of stock to and from water. Therefore, the need of water development over many areas is evident.

A forage acre is an acre of usable forage having the maximum density for the species or combination of species under optimum conditions. Clearly this is an important matter of information in estimating the carrying capacity of any range. The necessity of knowing the proper time for stock to enter the range in the spring in order to secure the maximum forage without range deterioration, cannot be over emphasized. In this connection, should be considered a deferred or rotation system of grazing.

But after due consideration has been given other factors proper utilization of the forage crop may fail because stock are not properly handled. With respect to sheep some of the elements of proper handling are: Loose herding; bedding out wherever night may overtake the sheep in the course of grazing, and a minimum use of dogs. Cattle can be improperly handled as well as sheep. They must have a sufficient supply of salt, properly distributed over the range. It will often be necessary to distribute cattle and keep them properly distributed over the range by herding, and fencing will frequently be necessary in order to insure good utilization of forage and to allow deferred grazing.

It is not my object in this letter to go into the matter of range management further than to show the great importance of the subject, the many factors to be considered and the need of thorough training on the part of any one who will engage in the work and accomplish the maximum results. In brief, it is merely desired to show that the field of range management in Forest administration is an extensive one and the need of trained help, great.

Those of us especially who have been engaged in administrative work on the National Forests for a number of years, have seen many changes for the better in grazing administration. Much has been learned and accomplished, and much remains to be done.

I believe there is an excellent opportunity for good men who have made special preparation for range management work. The best preparation can be had neither at school or in the field alone, but in both ways. One cannot know too much of botany and surveying, especially, and ability to recognize plants at sight in the field is important. The more one knows through actual experience with respect to the handling of all classes of stock on the range, the better.

In conclusion, I take much pleasure in saying that the Forestry Department of the University of Idaho is demonstrating its ability to do its part in properly training men for range management work. I am speaking from experience, as the Grazing Department of District No. 4 has several of your students and graduates employed at the present time.

Topography

(HARRY MALMSTEN)

Much has been done since the beginning of grazing administration on National Forests in the way of perfecting maps and accumulating information relative to the grazing resources. In this work, as in other problems, however, there is a point be-

yond which progress is slow if dependent upon rough approximation in revising maps and upon chance collection of detailed information. That this point had been reached, and that future progress necessitated systematic study of grazing resources was decided when plans were made to make

a grazing reconnaissance of the Caribou National Forest.

In making such a study it is necessary to keep in mind at least the major problems which come up for solution in the administration of grazing on any forest and the factors upon which the solution or decision should be based. From the standpoint of the range the main points to be kept in mind when making such a study are:

1. The class of stock to which each unit of range or area of range is best adapted, all factors considered.

2. The period during which each unit may be grazed without injury to the range or to the Forest or watershed.

3. The number of stock each unit will carry for the period during which it should be grazed, without injury to the range, the Forest, or watershed, and at the same time without unnecessary loss of forage through non-use.

To make a systematic study by which the above problems may be more easily solved the following plan of grazing reconnaissance is used in District 4. The plan is (first,) to make a good topographic map and second, to type the vegetation on the different units of area.

The first, and the most essential element of grazing reconnaissance is a good topographic map showing with practical accuracy all the drainage, culture, and relief features which the scale of representation will permit. The method used in making such a map will of course vary on different forests according to the general topography and amount of timber on the area. The method to be described is that which was employed on the Sevier Forest in southern Utah.

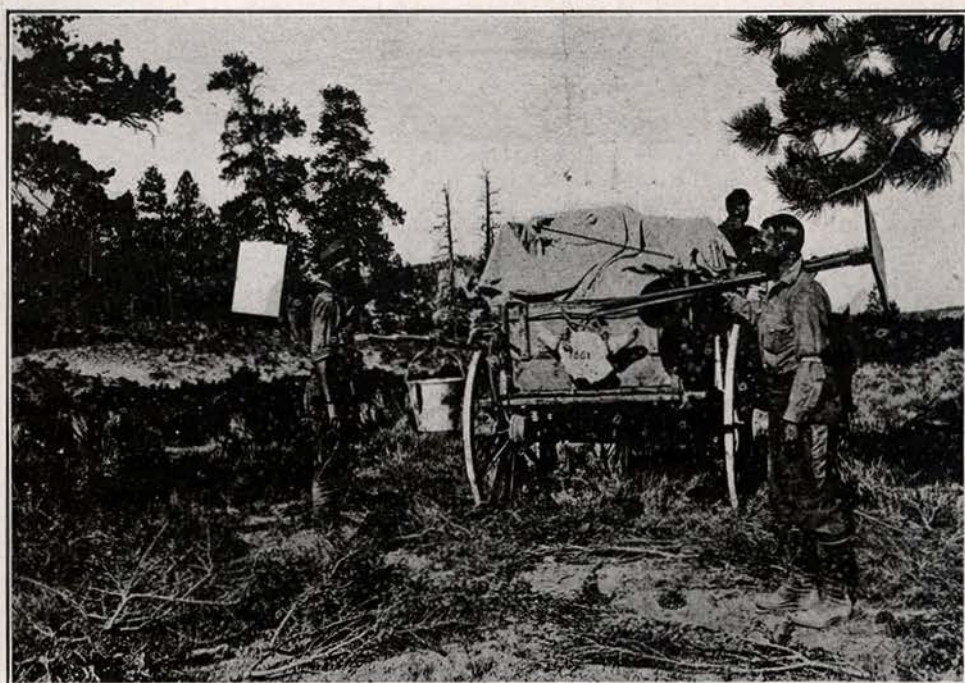
In making a topographic map of any kind it is necessary to divide the work into three main divisions, namely, primary control, secondary control, and detail topography.

PRIMARY CONTROL. On the Sevier Forest there are four triangulation stations of the old Powell Survey but only three of them were located so as to be available for use. Their elevations did not check, but their geographic locations were considered accurate enough for use. The elevations used were based on a bench mark of an old railroad survey. Because of the distance between the triangulation stations, it was necessary to plot them on a one inch scale in order to get any two of them on one plane table sheet. With this sheet and a plane table enough points were located so that when an enlargement of two inches to the mile was made there would be at least two points plotted on each plane table sheet. The location of these points was later tied in with the third primary triangulation station of the Powell Survey.

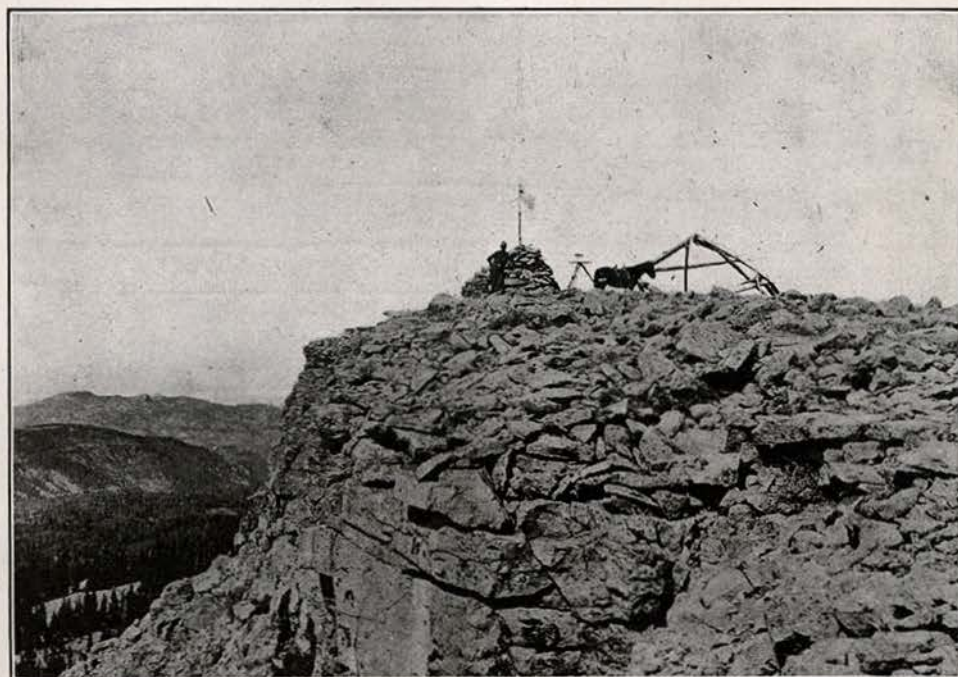
For a part of the Forest it was found necessary to run the primary control from a nine-mile base line in the valley of the Sevier. In all the work the elevations were obtained by means of vertical angles, corrections being made for curvature and refraction and also for the height of the instrument. The signals used were very prominent rocks or rock cairns with flags at their tops.

SECONDARY CONTROL. The secondary control was made in very much the same manner as the primary control, the work being carried on as follows: the first thing done, namely, office work, was the plotting of the primary control points on plane table sheets with a scale of two inches to the mile. At least two points, both of which could be occupied by the plane table were plotted on each sheet.

After plotting the primary control points, the plane-table man and his helper would go into the field and set or select signals on prominent points, ends of ridges, and any other place of prominence considered necessary for detail work. Signals were also set on Section Corners of the public land



DETAILED TOPOGRAPHY CREW



PRIMARY CONTROL POINT ON SEVIER

survey which were found convenient to tie in. Whether set or selected, the signals were usually from one to two miles apart according to the roughness of the area and they usually were set on an area of about a Township, as a unit of that size could easily be worked from one camp. Sometimes however, a much larger unit of area could be worked from one camp, but in either case the signals were all set before any of them would be located.

When all the signals on a unit were set the plane-table man would occupy the most suitable points probably those from which he could see the greatest number of signals. By means of intersection, resection, or the three-point method he would determine the location of all the signals set on the area, and by vertical angles, determine their elevations. If the two determined elevations of a point would not check within ten feet of each other an attempt would be made to get another reading on the point from some other station and eliminate the error. If it was not practical to get a third reading on the point, notation of the error would be made on the plane table sheet so that when the points were transferred to the traverse board sheets the error would be noted on these sheets and the points would not be used in the detail work unless necessary. There were very few points that would not check within ten feet and only one or two which it was not advisable to use in making the detail topography.

When all the locations of the signals on a unit had been determined and their elevations calculated, a tracing was made of the locations of the points with their elevations and sent to the detail topography party.

DETAIL TOPOGRAPHY. The chief of the detail topography party on receiving the tracing of the secondary control points from the plane table man, would transfer the control to traverse board sheets. He would plot as many control points as possible on each traverse board sheet and ar-

range the number of sheets as he thought would be best for the proper division of work among the members of the party. The members of party including the chief would then put these sheets on their traverse boards, go into the field, and working individually draw in the topography using a contour interval of 100 feet.

The detail topography was obtained in the following manner. The traverse-board man would usually go to one of the secondary control points, orient his traverse board by backsighting on another secondary control point and if possible check the orientation on a third point. With the board thus oriented he would sight, with an open sight alidade, on such features as prominent rocks on points of ridges and on sides of slopes, lone trees, forks of streams, prominent shrubs, and any other thing which might be of use in locating breaks in the topographic feature. He would also sight on cultural features such as cross-roads, telephone poles, bridges, National Forest Boundary posts, houses, barns, corals, etc. After locating as many points as possible from his set up, he would move his traverse board to some other point of prominence, orient by resection or the three point method, and intersect his previous sights thus locating all points sighted on. With an Abney Hand-level, he would read the angles of depression or elevation of the points and compute their elevation by means of special prepared curves. With these points located and their elevations obtained, the traverse board would sketch in the streams, contours, roads, trails, corals, fences, etc.

The men on completing their day's field work would go into camp and jibe their topography with each other, the line of division, usually a stream or ridge having been decided on as a line of division before going into the field. After the topography has been jibed it is filed in the office box and on rainy days or days when it is not

convenient to go into the field, the maps are inked, and are then ready to be assembled on completion of the field work.

TYPING

(HOMER YOUNGS.)

The Topographic sheets furnished by the field party are transferred to tracing linen in the office, and blue line prints are made. These blue line prints form the base maps used by the reconnaissance party in the location of grazing types.

The reconnaissance party may either start work on a forest one season behind the topographic party or may wait until the topographic work is completed. In any event, the actual reconnaissance work where the topographic map has already been completed is done as follows:

The blue line prints of the topographic base map are enlarged to a scale of four inches to the mile, and are sectionized, and cut up, each section four inches square being pasted on a grazing reconnaissance field sheet, No. 764.

The chief of the party assigns to each member of his crew to be worked each day, and gives him the corresponding maps mounted on the field form as above described.

The field man will take a section sheet, proceed to some point, the location of which is definitely shown on the topographic map, such as a peak, knoll, saddle, forks of stream, etc., and will then proceed thru the section, keeping located by the topography and sketching in the boundaries of the various grazing types in accordance to their relation to the topographic features. Occasionally where the topography is not detailed it will be necessary to resort to pacing and compass lines to locate type boundaries. The examiner proceeds over the entire section, offsetting so as to see all parts of it, usually following ridge lines or

other points of vantage from which it is possible to see a large part of the section. After sketching in the type boundaries, he proceeds thru the various types, noting the density, species and relative abundance of the plants making up the forage cover, and entering this data on prescribed forms. Before leaving the section, he writes up on the back of the map sheet a general description of the topography of the section notes on the accessibility of the various parts of the range, the character, distribution and accessibility of watering places; the species and location of poisonous plants; range destroying animals, and comments on the proper season of grazing, class of stock for which the range is best adapted, comparative carrying capacity, overgrazed area, and suggestions for management of the stock on the particular section so as to secure the maximum utilization of forage.

The examiner will generally cover three sections per day. If the country is flat and the topography is not detailed, he will gridiron the sections, crossing each twice on the forty lines. If the section has rough, detailed topography, he will not follow the forty lines, but will follow the prominent topographic features giving the best view of the area, offsetting as often as necessary in locating type boundaries accurately.

Every evening the types are jibed between adjoining sections, and the maps and notes making up each day's work are filed in a manilla envelope on which is written the number of the sections, township and range, the date and the name of the examiner.

This data is in final shape to be compiled in the office, and worked up into usable form during the winter months.

Dr. Shattuck to Dart—"What are the three most common words used by Freshmen?"

Dart—"I don't know."

Dr. Shattuck—"Correct, sit down."

SONG OF THE ILLINOIS GUARDSMEN

I've done my bit on the Border,
I'm in God's country again;
I've had my fill of the Border,
Of Greasers and Border men.

I've lived the life of a soldier,
No chance to "beat it" or shirk—
And the life of a soldier, believe me,
Is little but d—d hard work.

I've followed the flag of my country
In khaki and plain O. D.,
And up to date I am standing straight
In a way that is good to see.

I've done my bit on the Border,
I've had my fill of the same;
But I wouldn't trade the friends I've
made

For all I have lost in the game.

I've done my bit on the Border,
And now, thank God, I am free,
Although I know when the bugles blow
They will have a call for me.



CAMPUS BREEZES

Prof. Cook in Forest Utilization:—Now days due to the stage mechanical perfection man has attained nearly all of the hand carved furniture is made by machinery.

Ruckweed in Forest Engineering:—When asked how to measure the height of a three story building with an aneroid barometer, "I would ascend to the third floor and then lower the aneroid by a string to the ground, then measure the string.

Yates in camp after unpacking the mules. "This haste in packing has resulted in just what I expected, a button broken on my pajamas coat and oh horrors, my button hook is lost.

Cunningham pulling of this snipe hunting stuff the first night out on the Pot-latch.

Jackson, "Say, the first time I heard that stuff I laughed so hard I kicked the footboard off from the cradle."

Prof. Gale in Systematic Botany: "Now, I don't want to do any thing rash but you people must do less fooling and more laughing."

Malmsten in Forest Engineering Class: "Have you fellows seen the new compass the Forest Service has just issued?"

Fellow: "Spring it."

Malsten: "It is called a pickle compass. One of these kind that you place at the north end of a pickle so you can tell when you bit into it which the way the juice will squirt.

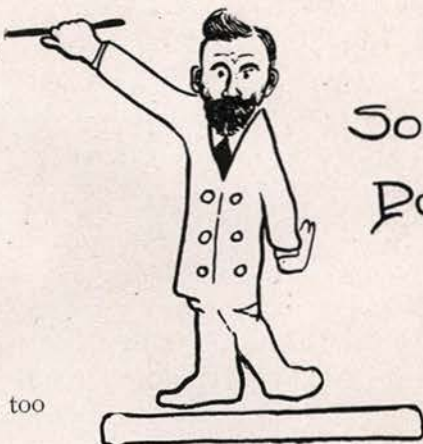
Pity beyond belief
Is mustard without beef.

Troubles of War Correspondent

I sit me down, my pen to turn
Upon the glowing field of verse.
When suddenly, with pain, I learn
The Queen of Sweden's cold is worse!

Rude wars convulsions, day by day,
Might prompt me to expressions terse,
But can I breath them while they say
The Queen of Sweden's cold is worse.

So please excuse my sad default,
As inwardly my luck I curse.
My soaring muse must cry a halt—
The Queen of Sweden's cold is worse.



Arnold: Yes, that's a garter snake.
Helen (innocently) Why! it's much too small.

Patriotism

Some one said Patriotism is doing all one can to make more distant the day when they will make concrete toothpicks.

A few synonyms for "Hit on the Head."

Drubbed on the Dome
Bammed on the Bean
Tapped on the Conk
Bumped on the Breezer
Biffed on the Coco
Busted on the Cranium
Whiffed on the Skull
Cracked on the Nut
Nailed on the Knob
Slugged on the Belfry
Lammed on the Peak
Dinged on the Brain-Box.

—Punch.

General: (to recruits practicing for attack) You must remember that this is very different from an actual attack. There are three essential differences. First of all there is the presence of the enemy. (Turning to recruit) What, is the second difference?

Recruit: "The absence of the general, sir."—Punch.

ETIQUETTE SELF-HELP HINTS

Scrape well thy first plate that thy second may be fuller.

When thou thinkest that thou hast reached thy limit, rest awhile and try again.

Eat heartily; lest thou be outdone by thy neighbor.

As you approach the table make a running jump for your chair endeavoring to be the first one seated. Everyone will probably remark about your wonderful agility. A modest blush will be your only answer.

Beside your plate you will probably find a small square piece of linen. This is a napkin. Tuck one corner under your collar and drape the rest over your bosom in a graceful manner as tho you had done it all your life. This will keep your chest spotless of everything but the soup which will leak thru in spite of all you can do.

While everybody is waiting for someone else to start something carelessly spring a few witticisms, chuckling joyfully the while. In the best families here and abroad, one who can do this is considered very "au fait" quite iridescent, as it were, in fact "de-bonne conduite."

Like

To eat is human

To digest—divine!

Taste makes Waist.

When the meal is about to begin, hitch right up to the table—placing your arms in an advantageous position on either side of your plate. Keep your weather eye on your competitors—forgetting everything but your work that is before you. Don't let anyone get ahead of you.

While sipping the soup make a cute noise like a leaky faucet. This is RECHERCHE in the extreme.

If a piece of meat crawls off your plate—capture it as soon as possible and then gaily snap it across the table to your vis-à-vis. This will probably make everybody laugh and will help to make the meal quite merry.

If, inadvertantly, you get a spot on the table cloth, absentmindedly place a piece of bread over it, butter side down. The butter will keep the bread from slipping off the spot.

If you spill your coffee in your neighbor's lap—instantly assure him that you really didn't care for the coffee anyway. Tell him not to mind it at all.

"Is it true," the lawyer asked the witness, "that you were the only sober man at the banquet?"

"Certainly not," replied the indignant man.

"Who was then?" asked the lawyer.—London Opinion.

"Do you think that this dress is too short to please George?"

"No, man loves but little here below, nor loves that little long."—Life.

Kaiser, may I go out to sea?

Yes, my darling daughter.

Paint your flag on the stern of your ship.

But don't go near the water.—N. Y. World.



Ring Around-a-Rosy

Miss Wilcox had been giving the class an elementary talk upon architecture.

"Now," she said, "can any one in the class tell me what a 'Buttress' is?"

Little Walter arose, his face beaming with a quick flash of intelligence.

"I know," he shouted, "a buttress is a uanny goat."

The visiting English merchant talking impressively to the American.

"In my firm," he said, "the clerks use 32,000 gallons of ink a year."

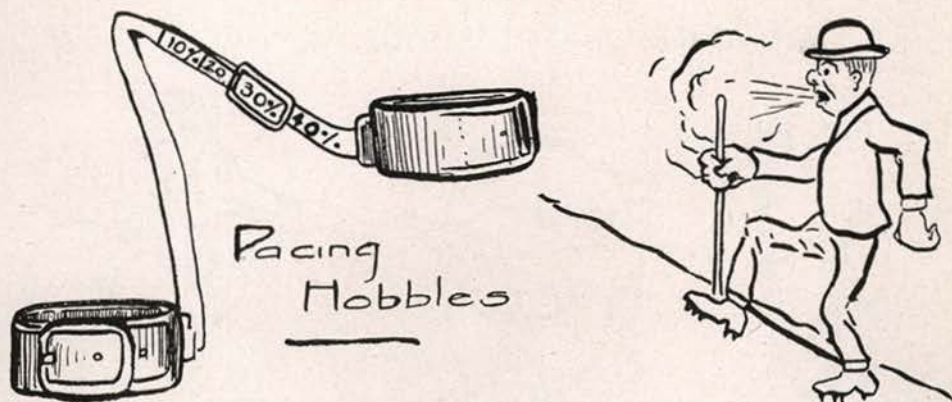
"Your office is evidently nothing compared with mine," replied the American. "Why, we saved that much ink last year by instructing our clerks not to do their i's."

"And continued the lecturer, "I warrant you that there is not a man in this entire audience who has ever lifted his finger or in any other way attempted to stop this awful waste of our timber supply and our forests. If there is I want that man to stand up."

There was a slight commotion in the rear of the room and a nervous little man rose to the occasion—and his feet.

"And now my friend, will you explain in just what way you have conserved the forests of our nation?"

"I have used the same toothpick twice."—From Harper's.



Advice to Lovelorn

By LAURA BELL WASHA CHESTNUT.

My Dear Miss Chestnut:—

I am engaged to be married to a beautiful young lady. We get along beautifully, never have any quarrels as I do just as she says. I was perfectly happy until I heard that this is the fifth time she has been engaged. Do you think we can be happy or shall I ask her to give me back my ring?

My Dear Harsh—

"I should not advise you to break the engagement. If this is only the fifth time she will probably save you the trouble.

Miss Chestnut.

My Dear Miss Chestnut—

I am in love with a beautiful young lady of the Junior Class. I am worried over the warm affection she holds for another young man who is not in Moscow but with whom she corresponds. Would it be proper for me to insist that she give up this correspondence.

Anxiously,

Ruck.

My Dear Ruck—

"Faint heart never won fair lady." You should insist that she cease this correspondence immediately. In case she refuses to do so, consult with me and I will advise your future.

Miss Chestnut.

There were cut from the National Forests in the year 1916, 604,920,000 board feet of timber. Of this amount 119,483,000 board feet was cut under free use privilege by 42,055 individuals. In all 10,840 sales of timber were made, of which 97 per cent were under \$100.00 in value, indicating the extent to which the homesteader, rancher, miner, small millman and others in need of a limited quantity of timber draw upon the Forests.

As a means of defraying a part of the expenses occurred in the past to the state for guarding its forests by the various protection associations why doesn't our economic Governor collect all of the dead and down stuff scattered over the forested areas and have a second-hand log sale?

The state of Idaho has a total of 54,272,000 acres of which 20,000,000 or 37 per cent is forested. This forested area includes over 129,000,000,000 board feet of timber of which over half is included within the National Forests.

The Deer Lodge National Forest is the only one in District I that is entirely self-supporting.

Uprightness—standing for truth like a tower;

Dignity—symbol of honor and power;

Beauty that blooms in the ultimate flower.

By STEPHEN HENRY THAYER.

ANIMALS—YOU SHOULD KNOW



His nose turns up
and his tail does too,
He roosts on section
corners; the COOGAROO.



Beware the
WACORAMUS



Roll up in the covers,
you great big lout,
Cause the WIETAS will get you
if you don't watch out



The blood curdling
BOREALIPUS



Of all the sounds
you ever heard,
The wierdest comes
from the CONTOUR BIRD

Trees

What is the wisdom taught of trees?
Something of energy, something of ease;
Steadfastness rooted in passionless peace.

Life-giving verdure to upland and glen;
Graces—compelling the praises of men;
Freedom that bends to the eagle and wren.

Largess—expanding in ripeness and size;
Shadow that shelters the foolish and wise;
Patience that bows 'neath all winds of the
skies.

She—Don't you think travel brings out
all that's in one?

He—Yes, especially ocean travel.—Santa
Fe Magazine.

What are you doing, John; copying his
paper?

No, sir. I am just seeing whether he
has copied mine correctly.

She—These light dresses spot awfully
easily.

He—You know it. I spotted your's
way across the campus.—Longhorn.

The Ranger's Soliloquy

Alone, by my camp fire I recline,
With my back against a lodgepole pine,
And the evening dusk is drawing near,
Bringing the night so cool and drear.

The peaks loom up above the draw
Like the jagged teeth of a crosscut saw,
The Sawtooth Range they're called, 'tis
said,
Named by a trapper long since dead.

I've turned out the nags and hobbled them
well,
If they take the back trail there'll sure be
hell,
The feed is knee deep, but when he's loose,
You just can't trust a durn cayuse.

All is still, and as the fire dies down,
I wonder what they are doing in town,
Movies, wine, woman and song,
I'll ride the trail tho it may be long.

A Ranger leads a lonely life,
Indigestion, for lack of a wife,
But as I dream and ponder, I reflect
'Tis better than to be henpecked.

Put on your boiled shirt and cut-away coat,
And a stiff high collar to cut your damn
throat,
Give me some boots and an old flannel shirt,
And an old slouch hat that's covered with
dirt.

You can have your fine cab if you will,
Cut-away, pumps, and a tailor made pill,
I'll take a good horse both wiry and tough,
And a pair of chaps that'll stand the
rough.

You can go to your grand formal ball,
Thru a receiving line clean down the hall,
And limply shake hands to and fro,
And lisp, How do you do? Miss So and So.

I'd rather dance in one roomed shacks,
Where you have to hurdle to miss the
cracks,
Where you swing yer gal 'til she's all in,
Then step right up and swing her agin.

So I'll mix the dough and douse the fire,
Pull off my boots and prepare to retire,
For at five a. m. I must rise from sleep,
And count three bands of Jackson's sheep.

JOHN GILMAN, '19.

Ethics in the lumber trade were given a new meaning at a recent meeting at Lancaster, Pa., of the Eastern Lumber Salesman's Association, when a resolution was adopted limiting the membership to salesmen who measure up to the highest standards of trade ethics. The resolution reads: "Be it resolved that this association pledges its influence to compel the performance of any contract entered into by any of its members. And bit it further resolved that any dealer so entering into any contract who advises us writing of the non-performance of any agreement or sale, that we so advise such member, apprising him of the complaint and ask for his side of the case. If, after such investigation, it be satisfactorily proven to our board of directors that our members is at fault, we use our best endeavors to have the matter settled satisfactorily to the complainant, and if such satisfaction be not given, the accused member be dropped from the association."

Glen A. Smith, supervisor of the Kootenai National Forest, with headquarters at Libby, Mont., in speaking of the possibilities of the wood pulp industry before the chamber of commerce, said that the Kootenai forest alone can furnish 87,000,000 feet a year for 50 years of the kind of wood needed for pulp. Mr. Smith believes that a movement should be started to induce the federal government to take up the reclamation of stump lands the same as they are reclaiming the arid and swamp lands. He points out that this would be a better proposition of the government as there would be no maintenance to provide for and the stump lands in most cases will make the most productive farms.

"But how can we live?" wavered the shepherdess.

"Oh, we'll manage to get along by hook or crook," replied the fisherman, optimistically.—Judge.

The sergeant paused on his nightly round and prodded the sleeping policeman.

"What, asleep again?" he growled. "Can it be from force of habit?"

"No, sir," answered the drowsy policeman, "it's just a habit of the force—Ex.

Failure

What is a failure? It's only a spur
To a man who receives its right
And it makes the spirit within him stir
To go in once more and fight.
If you never have failed, it's an even guess
You never have won high success.

What is a miss? It's a practice shot
Which man must take to enter
The list of those who can hit the spot
Of the bull's eye in the center.
If you never have sent your bullet wide
You never have put a mark inside.

What is a knock-down? A count of ten
Which man may take for a rest.
It will give him a chance to come up again
And do his particular best.
If you never have more than met your match,
I guess you never have toed the scratch.
—EDMUND VANCE COOK.

SILK TENTS

One of Our Specialties

SEND FOR CATALOG
*Seattle Tent
& Awning Co.
Seattle, Wash.*

Old gent—H-h-here, you b-b-boys can't
b-b-build f-f-fires here. F-f-first thing
y-y-you know y-y-y-you'll

Spokesman—Give 'er a little more gas,
mister or ye'll stall your engine.—Judge.

THE FILSON CRUISING SHIRT

for FISHING, HUNT-
ING, OUTING

(U. S. and Canadian Patents)



Recommended by cruisers for whom it was originally designed. It is the most practical garment for all outdoor life. Has six pockets, one large back pocket, 30x21 in.,



making a complete pack. Best material and weight guaranteed. Plain U. S. Shelter Khaki, \$3.50; waterproof Khaki, \$4.00; 20-oz. Gray or Blue Flannel, double shoulders and sleeves, \$6.00; 22-oz. Forest Green, \$8.00; 20-oz. Forestry Cloth, \$10.00; 24-oz. Black Plaid, Red and Black Plaid, or Plain Black Mackinaw, \$8.00; 30-oz. Red Mackinaw, \$8.00. Furnished shirt style, as shown, or open front coat style. State preference and collar size when ordering.

We make outing clothing for men and women—woolen shirts, khaki clothing, mackinaw clothing, corduroy clothing, woolen comforters, sleeping bags. Send for catalog 6, which describes these and gives prices. We deliver free on orders amounting to \$5.00 or over.

C. C. FILSON, Seattle, Wash.

LOGGER'S ELECTRIC STEAM SIGNAL WHISTLE

Type "E"—"TOOTS-E"



(Patent Applied for)

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