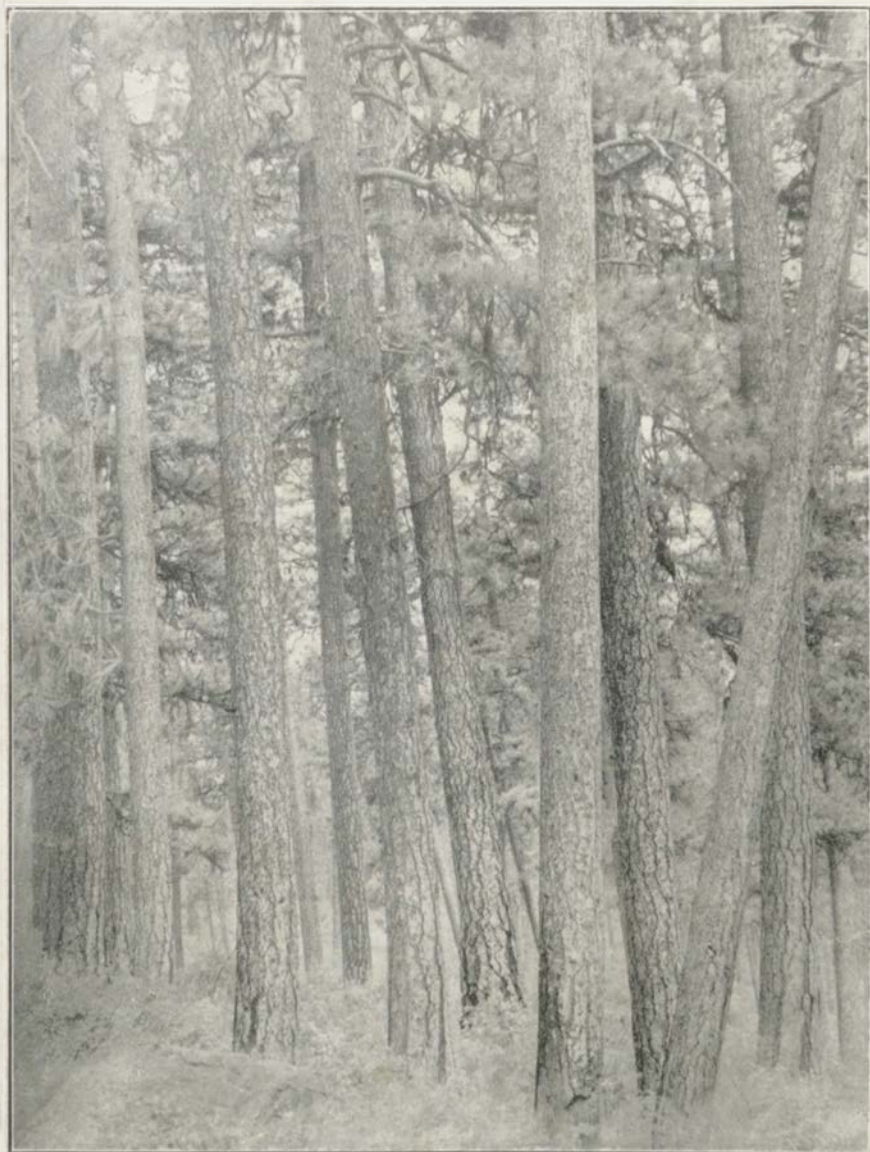


THE FORESTRY KAIMIN



Western Yellow Pine

1915

1926

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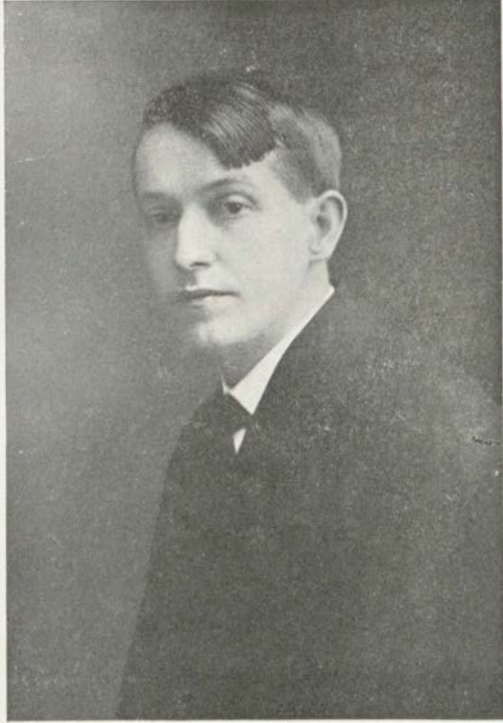
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Birthplace of the Montana School of Forestry



ENTRANCE TO PINCHOT HALL
The New Forestry Building

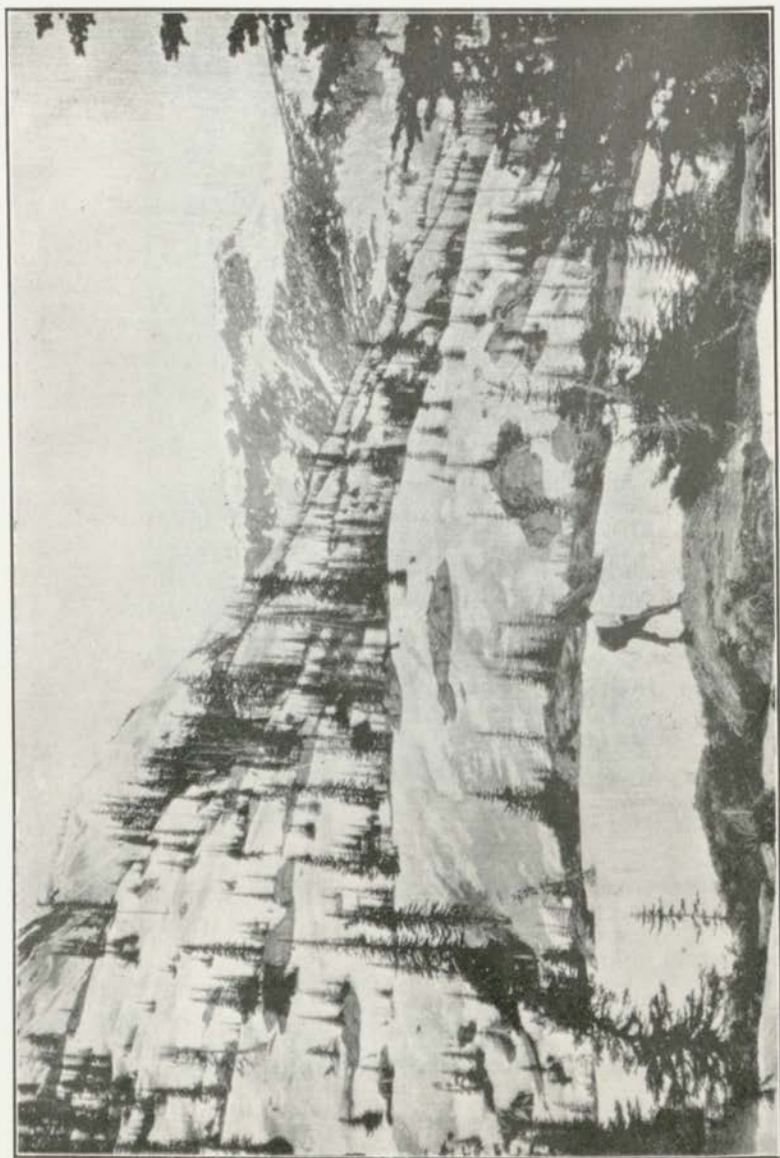


PROFESSOR DORR SKEELS

The Forest School's first instructor, the student's co-worker and friend, a loyal forester and a sincere lover of nature and wild life.

TO HIM

We, the members of the University of Montana Forestry Club affectionately dedicate this volume.



THE HEAD OF THE RATTLESNAKE

THE FORESTRY KAIMIN

1926

MAY

1926

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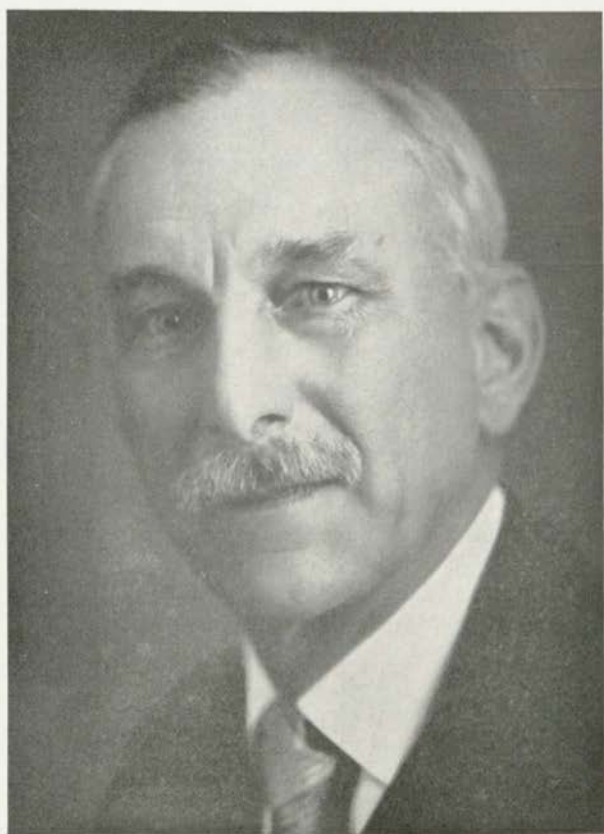
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DR. C. A. SCHENCK

DR. C. A. SCHENCK

Dr. C. A. Schenck of Darmstadt, Germany, one of the best known men in the Lumber Industry and in Forestry work throughout the United States, was part of the permanent staff of the School of Forestry of the University of Montana during the past winter. Dr. Schenck is probably better acquainted with the interrelations and advancements in the Lumber Industry and its related Forestry on both sides of the Atlantic than any other man. His lectures and courses were along this line.

He has spent the last summer in studying conditions in Central Europe and the Scandinavian Peninsula. He arrived in Missoula in December and returned to Europe in April, after completing his work in Missoula.

The noted forester came to this country for the first time in 1895, and upon his arrival he was secured to draw up plans for the George Vanderbilt estate in Biltmore, South Carolina. Several years later he founded and was made the director of the Biltmore Forestry School, the first of its kind in the United States.

He may be placed in line with Pinchot, Fernow and Roth, all four of whom are often termed "The Fathers of American Forestry." Dr. Schenck has been greatly assisted in advancing the forest movement in the United States by the help of former presidents Harrison, Cleveland, and Roosevelt.

Dr. Schenck was educated at the University of Giessen and the University of Heidelberg in Germany, receiving his Ph. D. degree from the former. During the late war he served in the German army with the rank of colonel.

He is an author, a statesman, and a diplomat. Among some of his more important books are, "Our Yellow Poplar," 1896; "Forestry in Kentucky," 1899; "Forest Utilization," 1904; "Biltmore Lectures in Silviculture," 1904; "Forest Management," 1907; "Forest Policy," 1911; "Some Business Problems in Forestry," 1898; "Oak Coppice," 1895; "Forest Mensuration," 1905; "Forest Finance," 1909; "Forest Protection," 1909, and a recent publication, "Forest Utilization in Europe."



PORKY

Slow-moving, waddling Porky,
He never has a care
For he knows he's well protected
By his most gosh-awful hair.

He'll chew your saddle leather,
He'll gnaw a hole right through,
And then for thanks, the dog-gone cuss
Will try to bunk with you.

He'll walk across your blankets,
Drag his tail across your face
While you're lying there a-wishing
That you were some other place.

He loves to rattle pots and pans,
And he's never quite content
Until he hears you cussing
And high-tailing from your tent.
Alban Roemer.

OPPORTUNITIES IN FORESTRY

Dr. C. A. Schenck

Forestry is a new thing, in America as well as in Europe. Its very newness tends to increase the opportunities in forestry on the one hand—by opening new lines of research, of economic use, and of investments; and, simultaneously, on the other hand, its newness mitigates against such opportunities as are met in other well established professions.

In a sense, forestry is, and will continue to be for years to come, an evolution, an innovation and a venture.

It is impossible to estimate the value of our national forestry assets consisting of timber ready for the axe and of young growth possessing a prospective value. It is striking, however, that the dollar value of the primeval forests left today—although the remnant comprises no more than one-sixth of the original forests—is far in excess of the value of all the forests existing 50 or 100 years ago. In other words: The less timber we have, owing to destructive lumbering, the greater is the value of the remaining remnants expressed in dollars and cents. One-sixth of the forests is worth more than was six-sixths; and it stands to reason that one-tenth and even one-twentieth will be worth more than one-sixth, today.

The present value of our woodlands and of our forests is, without a doubt, under-estimated by the public as well as by the investor. While the total wealth of the nation is estimated to be 320 billions of dollars, the value of our woodlands, comprising one-fourth of the area of the U. S. A., is supposed to be no more than four billions of dollars: This is less than the value of the woodlands of Germany, a country not much larger than is Montana.

So large are our woodlands, that they could, if they were properly managed, supply the needs of the entire world.

It is often claimed by lumbermen and by foresters alike that the use of timber is diminishing and that, as a consequence, the needs of the United States as well as of the world are getting smaller. True, brick and concrete are replacing lumber in house building; steel is replacing timber in the construction of railroad cars; iron is replacing wood in fences: In spite of all, nevertheless, the actual demands on the forest are increasing rather than decreasing, the world over.

No more than 60 years ago, spruce-wood came into use as the chief raw material for paper. Today the United States do not produce spruce wood enough for their own needs. Twenty years ago, rayon silk was a novelty. Today, rayon silk, made of wood, is rapidly becoming a favorite among the textiles. Nothing stands in the way of the replacement of cotton by

wood fiber—a fiber as good and as strong as is cotton, but cheaper than is cotton. Our trees contain all of the ingredients required for the clothing of mankind. Science and technical art have been slow in promoting the use of the woods, to that end. The chemistry of wood fiber is the most intricate and difficult section of all chemical research.

The opportunities in this connection are immense.

By a simple process, wood can be converted into ethyl alcohol which, indeed, is a by-product of wood fiber manufacture. This ethyl alcohol contains more energy per gallon than does gasoline. It is merely a question of time, of research and of invention; and the solar energy stored in our trees will be used as motive power in our automobiles.

The chance is there! The opportunity is there!

Wood fiber, however, may do more. The young May-twigg in which the wood fiber forms, is or may be used as food for the ruminants. Again and again, in a tentative way, the conversion of wood into ensilage—a simple laboratory process—has been attempted. So far, however, the inventive genius of an Edison has been lacking to make the experiment technically successful.

The time may come, too, when wood is converted, with the help of yeast, into fats to be assimilated by cattle or by hogs.

The possibilities and opportunities are enormous. We are at the threshold of an era in which the forest is the first station of a chemical factory instead of being the last station in a quarry yielding fuel and timber. The impossibilities of today are the common places of tomorrow.

We should not under-estimate, however, the value of the forest as a purveyor of lumber and thus of American homes. The most important social question of the day is the homing question. Without individual homes for individual families, our slums must increase, with all the evils adhering to slum life. The forest, by supplying the essential raw material for cheap homes, forms the chief bulwark against social upheaval and thus against moral and national decrepitude.

For the student of nature, the forest offers a novel, huge and wonderful opportunity in research. Forest research has been trailing behind agricultural research; it is more difficult than is agricultural research; forest-experimentation depends on a larger multitude of factors than does farm-experimentation; no scientist engaged in forest research can be—what he ought to be—a specialist in chemistry, in mycology, in bacteriology, in nematology and so on and so on. And yet it is these very studies and these very sciences which must be used by a genius revealing to the world the secrets of forest life and, incidentally, the secrets of silviculture. European forestry, ignorant of these secrets, has undermined the existence of the forests almost as badly as has done destructive lumbering in America.

Thus it is that the opportunities for research in forestry—and especially in silviculture—are immense. A Darwin is needed to explain the life of the woods; a Roentgen is needed to send his rays of elucidation into the darkness of forest soil; and an Einstein is needed to reveal the relativity of site and of time in American silviculture. The opportunities are there, wonderful opportunities, but leaders and geni—and their helpers—are lacking to exploit them.

It is obvious that forestry cannot flourish anywhere, on a large scale and in the long run, unless it be an investment as remunerative as is an investment in farming, in stocks or in industries.

So far, the world over, opportunities for investments in conservative forestry have been lacking. It is safe to say that even in the woodlands of Europe which, in area, are as large as is the total woodland area of the United States (450 million acres), conservative forestry productive of timber is the exception and not the rule. Like any other industry, certain economic factors are needed in any country to put conservative forestry, at a given time and at a given place, on its feet. It is obvious that some sections of Europe as well as of the United States lend themselves better than others to investments in conservative forestry. The opportunity for such investment is, in other words, not a universal opportunity but an opportunity depending on locality and on time.

Destructive lumbering is the only alternative left, under American conditions, where primeval woods are converted into commodities. Unfortunately, the primeval woods are usually found in places where, at the time being, conservative forestry is a poor investment. In such cases, two possibilities are open: The areas depleted by the lumbermen must be taken in hand by the state and by the nation, at least temporarily, or they must lie idle for many a year to come. The opportunities for private investments in conservative forestry are bad; no one would practice in America destructive lumbering if conservative forestry were a better investment.

Economic questions—and forestry is an economic question—cannot be solved by mere science, in our case by the mere science of forestry. Forestry as a business cannot be established by science any better than was established the chemical business in the United States by the science of chemistry: The economic conditions had to be right and ripe before chemical factories could be built in the United States.

Here it is—in the economic conditions—that the economist, the politician, the lawyer and the financier must combine to bring forestry into its own. If we had had in the United States, during the last fifty years, a little less forestry-science and a little more political vision and economic help and financial insight, more conservative forestry would be practiced in the United States today than we actually have.

Theodore Roosevelt and Gifford Pinchot, neither of them a forest scientist, have done more for the advancement of American forestry than has all the science of all scientifically trained foresters. There are wonderful opportunities for the forest-politician, for the forest-economist and for the forest-financier in American forestry. So far, they have been disregarded.

For the young man who wants to make forestry his life work, there is a huge number of opportunities by which he may make himself useful. There prevails for him, however, the danger of overspecialization in given lines of work. In the last analysis, forestry is nothing but common sense applied to woodlands; and he is the best forester whose resourcefulness allows him to solve the ever-changing problems of the forest. It should not be forgotten, in this connection, that forestry is not silviculture alone; and that logging will always be the major part of the work of a forester in actual charge of a forest, since forestry is, essentially, a problem of transportation: The finest tree in the world has no value unless it is accessible. The opportunities for the American forester to be useful are large, particularly so in the field of logging and lumbering.

In so far as forestry is a business, a general knowledge of men and a general knowledge of affairs is more important for the practicing forester than is any special knowledge of any of the many sciences connected with forestry.

Its very difficulty is the charm of the profession of forestry. It requires, indeed, super-men who are scientists on the one hand and business men on the other.

There is not much of a financial reward for the practitioner of forestry. Anyhow, is life worth living? Some people claim that it is not; and these people are almost right: Life is not worth living unless it be lived for a great cause. And what cause in America offers greater and better and nobler opportunities today for a life that is worth living than does forestry?

And the reward for a life devoted to this opportunity is its very immortality.

GRADUATES AND RANGERS

By Fred Morrell

The United States Forest Service will doubtless continue in the future as it has been in the past, the largest single employer of Forest School graduates. The Service is now committed to a definite program of materially increasing the percentage of its men who have had college forestry training. This policy has been vigorously urged upon the Service by Forest School faculties. There has been much discussion of the policy during the two years past in official circles of both the Forest Service and the Forest Schools. This discussion has served to create a better understanding on the part of Forest Service men of the problems confronting the schools, and on the part of school men a better understanding of the recruiting and organization problems of the Forest Service. But what the policy in employment of Forest School men in the Forest Service should be seems far from clear either to men in the Service or in the Schools.

There seems to be a feeling in some schools that their men should not enter the Forest Service as rangers, or serve in the capacity of rangers. This is especially hard to understand in view of the position taken by the schools that not less than 50 per cent of district ranger vacancies should at this time be filled by Forest School men, and that no man should become a supervisor who is not a graduate in forestry. Certainly it does not square with the policy of the Forest Service that with few exceptions a man should not become a supervisor who has not been a successful district ranger. It is an axiom in business that a superior officer should so far as possible have learned through experience the work that his subordinates have to perform. I can think of no reason why this very generally accepted rule does not hold good in the Forest Service.

Then there are seemingly those who agree that Forest School men should serve in the capacity of Forest rangers but they are much disposed to put it on the basis of "getting experience,"—conveying the idea that the Forest School man's service as a ranger is a part of his training, a fairly short experience to be gone through as he goes through school, and out of which he is to pass quickly if he is a man of average or better than average ability. The first fault that I have to find with this point of view is that the ranger district cannot be efficiently handled by a succession of men, no matter how capable they may be, who stay on it each for only a year or two. Obviously no one can learn the geography and the resources of an area of land as large as a ranger district is and will be for many years to come, in so short a time. Much less can he get acquainted with the Forest users to the extent necessary for good administration or make and put into effect even

the simplest plans for utilization of the resources. To be sure, the new ranger finds his district a going concern with some plans made and the job reasonably well cut out for him, but his work isn't all mechanical and conditions are continually changing. The ideal is that he shall become the resident manager of the property. There isn't much more argument for the idea that good management can be secured by changing men under Civil Service every two or three years than there is for assuming that good government can be secured under the old political spoils system of changing employees in executive departments of government every time the party in power changes. And so as I see it, among the things that the Forest Service should strive for in organization is permanency of tenure. And permanency of tenure in the district ranger grade is just as necessary as it is in any other grade. If given the choice of holding the present ranger force where they are for ten years, or of having two groups of men twice as capable on the average who would each stay five years, or a group three times as capable who would each stay $3\frac{1}{2}$ years, I would choose the former.

This then, is the first reason as I see it, why we should hope that Forest School men who go into the ranger grade will look at it as more than a "getting experience" venture. It does not to me appear as a discouraging outlook for college men who can find satisfaction in the kind of work and the living conditions that the Forest Service has to offer. The living conditions are probably well enough understood by the Forest School faculties, and students of Forest Schools that they do not need description here. The same thing can probably be said about the district work as it is today. The only apprehension I have here is due to the fact that there has seemed to me to exist in some quarters an exaggerated idea of the amount of forestry that could be practiced in the National Forests if there were only enough competent foresters to practice it. That more and better foresters could practice more forestry than is now being accomplished even under present economic conditions and under present financial limitations is beyond question true. But how much more? Certainly not enough that every man can, because he is a good forester, go about the practice of forestry beyond what economic conditions will permit or beyond the financial limitations under which the Forest Service works. One hears a good deal of criticism to the effect that men coming out from Forest Schools are put to digging post holes, building telephone lines, trails, etc. And critics seem to believe that that is all due to wooden-headedness or pure cussedness on the part of their superiors. No doubt some of it is, but the fact remains that much of the protection and administration job of the Forest Service in the past and much of it in the future will consist, speaking figuratively, of "digging post holes." On much of the National

Forest acreage the job is singly one of protecting and developing the resources. If there isn't any sale for the resources and no money for improving timber stands the forester can't do much more with such an area than the level-headed horse sense variety of individual who has gotten his education in the woods. The meat of this is that every man who comes into the Forest Service in positions such as district ranger, supervisor or member of the supervisor's staff, cannot go a long way in the practice of forestry, just because he wills it, nor just because anyone else wills it. Changes can to some extent be made but it is well that we all understand and appreciate the practical limitations.

Another reason why Forest School men must expect to stay longer at ranger and similar jobs if we continue to recruit a larger percentage of our men from the schools is that there will apparently be no other jobs open to them. It is true that the demand for foresters outside of the Federal service is increasing rapidly; the work of the Forest Service is expanding into new lines, over more territory and the demand for National Forest resources is increasing. The outlets for men in the ranger, scaler and junior forester grades are increasing. An example of this in one district of the Forest Service is shown in the following figures which give the number of rangers and the combined number of all other grades of field going men in the district employed on December 31 at five-year intervals:

	1910	1915	1920	1925
Rangers	219	196	186	188
All other field grades.....	90	129	135	130
Total	309	325	321	318

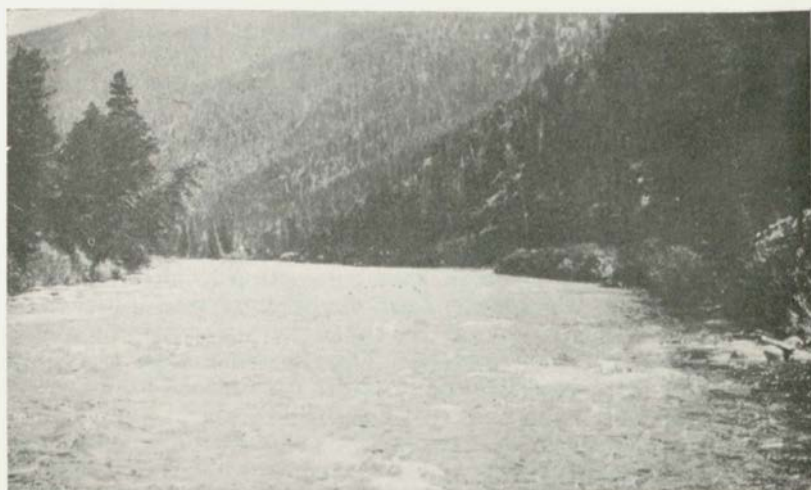
In a force of nearly constant numbers the percentage in the ranger grade has decreased from 71 per cent in 1910 to 59 per cent in 1925. This has been due to expansion of activities and intensity of use, largely sale of timber that has resulted in specialization, and perhaps the taking away from the ranger grade of some of the work that it did fifteen years ago. There are a good many men in the Forest Service who believe that the latter thing has been done too much and that this tendency should be checked and that we should bring about a condition more nearly comparable in this connection with that which existed in 1910. Personally I am skeptical of our ability to do that but if we can it must be through more permanent and more capable district rangers. The Forest School graduates will fill the latter specification, and if we succeed as we would like in this connection they must fill the former.

Our turn-over in ranger positions should not be more than from 10 to 20 per cent a year,—an average tenure of say 7½ years. As time goes on the turnover should become less,—not more than 10 per cent. The sum of this is that the uni-

versity trained rangers must look forward to staying on the job about as other men have stayed on it if we are to recruit largely from the Forest Schools.

Finally, I hope that the Forest School man will be able to see in the ranger work a real job,—a chance to leave his imprint in the way of some definite accomplishment in the handling the physical resources of his district. I hope that the man and his associates in the Forest Service will learn to measure success by that yard stick more than we have done in the past. I hope that the time may speedily come when we shall think of our own success and the success of our friends, not in terms of what rank we have attained, (how definitely we have removed ourselves from the woods to the swivel chair) but in terms of what monuments we left behind us in the woods as marks of the work of a forester.

I have tried to point out that all men in the Forest Service will not be able to do this in any intensive way soon because there is much "post hole digging" to be done. But we can't even dig good post holes by the mere process of "passin' through."



THE CLEARWATER



WHERE THE RANGER'S WIFE IS SUPERVISOR

Photo by K. D. Swan, Courtesy of USFS

A RANGER'S WIFE TALKS

Mrs. Albert Yochelson

Somebody has said that if the practicality had been considered, the great events of this world would have never been accomplished.

This has often recurred to me when I made a resume of all that being a ranger's wife entails. I feel sure that other ranger wives have often experienced the same mental analysis of its worthiness in so far as its practical side is concerned and its material compensation. Not that we should have reconsidered our choices of husbands—rather that they should have reconsidered their choice of a job. However my analysis of the position has always made me exceedingly thankful I was not practical.

I was grossly ignorant of a ranger's work and of rangers, generally speaking, previous to and upon entering my new sphere as a ranger's wife. Surely, I knew him as a romantic figure, who poses for eastern tourists on his sleek black horse, dressed immaculately in a "take your eye costume," eulogized as "Guardian of the forests." I did not know him as I have come to know him, a frightful aspect appearing after being out on a two week's fire, with a two week's growth of beard and whiskers; with a faithful, though not at all handsome horse that responds to a strange assortment of endearing (?) words.

I have come to know him as the "Guardian of the forests" in a much broader sense. He guards its ranges from trespassing sheep and cattle as well as from fire. I have found him to be still a figure of romance if one can accept romance, even after the hard stern realities are exposed.

I do not believe there is any work in which man and wife can more truly work side by side, as comrades, than in forestry, especially in the status of ranger. Though my ignorance of the true nature of the work was astounding, I soon became exceedingly familiar with it from a technical, idealistic, practical and cussing standpoint. In my close association with it, I could not do otherwise. On every possible opportunity I accompanied my husband on field trips, though I wish to state emphatically, never on a fire.

After a fire was reported, and immediate preparations were being made to go to it, I made myself as inconspicuous as possible. I did not even dare proffer my services after the time I attempted to pack some things for my husband and put in his pajamas. Right here I learned the importance of haste, of a light pack, and of taking only the very necessary items.

When reports cried for attention, I even tried my fingers on the old standby, the Oliver typewriter. I suppose because it responds so magnanimously to the often unsympathetic touch of the ranger (it being very strong) it is accorded the position of favorite. I experienced considerable difficulty learning a ranger's diction. His language is hardly euphuistic. He is not partial generally to words of many syllables and I found Sears Roebuck catalog considered by some, undisputed authority.

On my extended field trips with my husband, I learned to bear with Spartan courage, aching bones after a horseback ride of thirty miles, a burning skin and parched lips. Vanity died a natural death in the face of the indescribable charm of the wild, so that freckles and sunburn received no notice. I found I could subsist admirably upon pork and beans and "Ranger's delight," a dish reeking of the mystery of the Orient. However, when one becomes more familiar with it, he finds it to be, eggs as a background combined with cheese, onions, a generous dash of pepper and any other scraps that may be utilized successfully or otherwise. These are traditional ranger's dishes, from what I can gather, and anyone who cannot like them has lacking an essential taste needed in the Service. I mastered the art of throwing the diamond hitch, though Sambo just would not obey when spoken to decently. He was a ranger's horse and responded accordingly.

I never counted stock. Mathematics always made my head turn, so while my husband counted them, I sat by watching Bill Jones size up the ranger as to how many more he could turn out on the range.

Thus through my close association with my husband and

his work, my knowledge expanded and with the expansion grew the ideal and love of it. At first it did not mean this to me. I had to accept the work to get my man and I accepted it as something inevitable. Now that acceptance is a God-given ideal.

So many of my friends and my family have asked me, "What is the work of the ranger?" I cannot specifically answer that question for all my contact and association with the work. I wonder if anyone can. Before I married into the family, meaning the Service, one kindly, gruff old stockman characterized it to me as "A good job for a lazy man." How I wish he might change jobs with the ranger! He would find he had to be diplomat, lawyer, mechanic, preacher, doctor and goat, besides being a forest ranger; he had to possess a fair knowledge of all the arts under the sun; to bear stoically all the complaints of permittees, and the usually justifiable upbraidings of his superiors for certain work not being accomplished, though how a dozen tasks are to be done at once has never satisfactorily been solved. Yes, the ranger can push Job entirely off the stage.

Humbly, though staunch in my belief, I should like to give my viewpoint of the Service, the men and what it means to me.

The Service embodies idealism, loyalty and brotherhood all tending toward a noble and lasting work, the conservation and proper distribution of our natural resources.

The men individually are of the highest type of manhood and moral stamina. They could not be otherwise. Nature leaves her clean indelible mark of character on them. They are men of tried and tested strength, the weaklings are soon weeded out and lost after the stern realities and dull routine appear. They are men who are idealists, who see that through their work they are upholding the principles that mark us as a great nation.

It means to me all the pride these words can convey, "I am a forester's wife."

TO A CHIPMUNK

A chipmunk shared my cabin
Up on a lookout peak.
We soon became quite chummy
Although we didn't speak.

But one sad day in zealous mood
I baked a batch of bread;
Came suppertime, the bread was gone,
And poor Chippy,—he was dead.

Alban Roemer,



A MOUNTAIN LAKE

THE MOUNTAIN LAKE

High in the mountain fastness
There gleams a liquid gem
Surrounded by rugged peaks and crags
That hide it away from men.

Here the doe with her spotted fawn
Cools her lips and lingers to rest
When the dawn's first flush steals over the ridge
And drives night to its home in the west.

Its surface forms a mirror
That reflects the shores about
Till the wind starts ripples dancing
And reflections are blotted out.

Alban Roemer.



ELK

WESTERN ELK MEAT FOR EASTERN TABLES

By Ernest W. Shaw

The presence of the wapiti or American elk in public and private parks for many years past has proven this noble game animal, where confined to few in number, to be susceptible of semi-domestication. Perhaps the greatest aggregation of these animals under private fence could have once been found in Austin Corbin's Blue Mountain Park, New Hampshire, where at one time there were 500 head, more or less. But in this great game preserve were approximately 10,000 acres of mountain and stream and open grassy meadows scattered throughout the woodland forming ideal conditions similar in a marked degree to natural habitat of elk. For more than a generation, in various parts of the west and middle west, the propagation of elk for commercial purposes has been attempted in a small way without promising financial result. It has remained for two young eastern men living within a stone's throw of Cape Cod to capitalize the idea of raising elk in the east on a commercial large scale.

Percy R. Jones originated the idea, and he with his

brother Maurice and their father E. B. Jones of Middleboro, Massachusetts, have formed a company under the name of The Elk Breeding and Grazing Association, Inc. This corporation owns and now has under game fence approximately 600 acres of land of woodland type which in years past was heavily cutover for its white pine, maple and oak timber. This land though carrying a light stand of second growth hardwood with some pine, has largely come in with scrub-oak, which browse, except when budding in early spring, must be considered of doubtful forage value.

In the low swampy sections of the tract is found a limited variety of feed and browse. Grasses, the natural elk food and which in their native element consists of by far the major portion of elk diet, is conspicuous by its absence. A strip of about 100 feet in width has been cleared paralleling the inside of the enclosure and it is planned to seed this strip down to wild and tame grasses; but to date this ground has not been broken up.

The plan for stocking this present pasture and others to be constructed on both owned and leased land, contemplates the purchase from the Government of a majority of the elk now on the Wind Cave Preserve in South Dakota and on the National Bison Range in Montana. It is anticipated that from 1,000 to 1,200 head will be obtained from these two sources. Already 60 head have been delivered from Wind Cave and ten express carloads (about 400 head) have recently arrived from Montana, with more to follow in the near future. In addition to the above, negotiations are in progress for the purchase of small scattered bunches from private owners. It is no small nor inexpensive task to capture and transport one thousand wild elk across the breadth of these United States; and the Jones Brothers may well be classed as true adventurers in conceiving and carrying out this project to its present status. If completed, and it seems in a fair way to be, it will constitute the largest shipment of wild game in the history of the world. In all there will be three trains of express cars consisting of ten 70-foot cars holding 40 head, each car divided in pens holding six to eight elk. There is also attached a car for the caretakers and their equipment,—400 head to the shipment. The very magnitude of the thing conjures the imagination and would restrain any but an adventurer from attempting it. The express bill alone is about \$15,000 for each train.

However, there is a question which naturally arises in the mind of the well informed: How can the Federal Government which has for years been trying to stimulate public interest in the preservation of the rapidly diminishing elk bands in the vicinity of the Yellowstone, now justify its position in disposing of them wholesale? How come?

The answer is simple when the situation is explained.

The National Bison Range and the Wind Cave Game Preserve were constructed to save from probable extermination

the American bison; specimens of which were donated for that purpose by the American Bison Society. Originally, there being a temporary surplus of range, a limited number of elk were captured and shipped to both areas from the depleted southern herd in Jackson Hole.

Owing to the protection given the range enclosed, both grass growth and density was stimulated and because of the excellent grazing conditions plus the continual warfare against predatory animals within these preserves both bison and elk have so increased as to crowd their carrying capacity. The question of winter feed has become a problem. It has reached the point where one of two things must be done. Either enlarge these pastures or cut down the numbers of game within them. It happens that the former is wisely not compatible with the program of economy now issuing from the White House, therefore some of the game must go. Since Congressional appropriation was primarily intended and originally made for the purpose of saving the buffalo, the interloping elk must be sacrificed. The Government has attempted both live sale and market butchering, and although quite successful in a small way, it has found this method of reduction too slow a process. The problem is much too acute to permit further delay and demands an immediate reduction of animals.

At the psychological moment the Jones Brothers appeared upon the scene with an offer to purchase and the trick was turned. Anyone of previous experience with our Uncle Samuel knows it was not quite so simple as that. There were reams of correspondence with conferences at Washington and inspection of pastures and fences both in Massachusetts and the west; but eventually a workable agreement or contract was executed, under which the corporation was to construct or at least supply the money for the construction of several miles of cross fence on the Bison Range and acquire (at a price) all but 30 head of elk ranging there, with two years in which to remove them. According to conservative Government records this should mean about 800 head. According to Warden Rose who is in charge, there will be at least 1,000 animals to come from there. Wind Cave will supply, under a separate agreement, 125 head more.

To plan and arrange for the capture of 1,000 wild elk is a comparatively simple matter—on paper. In reality it is far from that. It is the greatest undertaking of its kind in the history of the country. Carload lots have been successfully shipped from time to time; but this is an epic in the annals of wild game shipments.

The writer took part in the capture and delivery of the first trial car shipped from Wind Cave. It was not a new experience except that the handling of wild game in bulk always provides new and interesting opportunities for observation. Four thousand acres under fence is not a particularly

large pasture as pastures go in the western cattle country, and almost any cowman would casually drawl, "Sure, throw a bunch of riders around 'em and just drift 'em right into the corrals." Well hardly! The critters just naturally won't drive. They object most decidedly to being forced. Likewise Nature has provided them with an inherent tendency to run up hill when frightened, and the corrals at Wind Cave are located down hill in the lowest corner of the big range. With a bunch of mounted men we tried drifting them although those of us who had previously attempted it held out little hope of success. Several times it was thought we were at last to be successful, but so soon as a band discovered they were being gradually forced in a given direction and away from the rough country, they would stampede and a troupe of cavalry could not hold them. They split into individual herds of one elk each and broke back over and under and between and through the mounted men. It is amazing the amount of stamina an elk can display even when fat and apparently run off his feet. As one of the punchers expressed it, "The dadburn things can out run my horse, when their tongue hangs out so far they have to kick it out of the way to keep from stepping on it!"

Warden Chambers proposed an easier way. A method of capture which proved easier on horses, on men and on elk. Elk must be handled gently and without excitement at all times. This applies before as well as after capture. At Wind Cave, there are two small interior pastures of perhaps four to five acres each and in one of these nearest to the main range, are located the corrals and loading chute. The warden has been salting the buffalo in this small outer enclosure. Elk are great salt eaters and frequently come down of a night to work on the salt left by the buffalo. We wondered why none of us had thought of it in the first place. Each morning some man was delegated to sneak up in the dark on the down wind side about 5 A. M. and close the gate. When daylight arrived we all would stroll up there to check what had been caught. It was as simple as that! Sometimes there would be two or three or more, sometimes none. One morning the gate was shut on sixteen head. Later in the day the horses are saddled and the gate is opened between the two small pastures. Slowly and carefully to not frighten them into dashing against the fence they are drifted in with the previous catch. Then that gate is closed, the one opening to the main range is opened, and the stage is again set for the following night. It is a slow but entirely satisfactory method at Wind Cave, since there are but 125 head to come from there. One-half of these have already been delivered to their new home on the Cape. A quicker and much more expensive method which includes about eight miles of drift and wing fences is in operation at the Bison Range, where about 200 head have been captured and are being fed hay while awaiting shipment.

But to return to Wind Cave. Two carloads were finally trapped and on that day cars were ordered spotted for loading at Hot Springs, 15 miles away. Horses and riders were requisitioned for the following morning to help corral the animals in the small pasture. At day break we were in the saddle ready for the real test. Approaching the pasture we saw seven panels of fence down where a band of elk had piled against it during the night and escaped to the main range. Fortunately they did not break down an exterior fence. We wondered if our entire catch had broken through, but soon elk could be seen on the slope of the small pasture, and with men left to guard the broken fence the remnant were drifted into the smaller enclosure leading to the corrals. Enough were left for a load and it was decided to ship that one first car anyway.

It takes a real knowledge of elk and much patience to pen them. These corrals are built on the line of fence between the two pastures. They are constructed of eight-inch plank and are nine feet high. There is one straight wing of the same material extending from the gate down the division fence for a matter of two hundred yards. On the other side the wing slants out and away from the gate, then sweeps in toward the opposite wing in a great circle, in shape much like a gigantic fish hook. It took eleven riders fully two hours to carefully work the 52 head of wild suspiciously timid creatures within the semi-enclosure of the wings. Time and again it was nearly accomplished, when they would whirl and dash madly away from it, to stop and mill in bewilderment at the cordon of immovable horsemen. Finally they entered, the old cow in the lead trotting nervously ahead followed by the band each individually ready to break back; but at the proper moment the riders came dashing forward to hold the entrance; and then the "fish hook," a recent piece of construction not previously tried out, justified itself. Realizing they were trapped, the elk came wildly plunging around the inside of the circular fence hoping to find a way by the riders at the entrance, but the fish hook turned them back passed the riders and up the wings toward the corrals again. It took another hour moving up a step at a time—standing motionless when the elk became alarmed or appeared the least panicky, to work them the two hundred yards or so to the gates at the end of the wings. Here they came to a last stand, but the riders and men on foot formed a compact line across the wings and there being but one direction with no human beings in sight, the last elk finally edged itself within the first corral and the two men stationed for that purpose heaved on the long ropes, swinging the gates shut, held fast by an automatic brace.

During the corralling of this band and the subsequent loading there were no casualties. Frequently elk will pile up

in terror at the close proximity of man when first closely confined, and broken necks and legs sometimes result.

By the time the animals had somewhat recovered from their first fright and become partially reconciled to the cramped quarters of the pens, the motor transportation arrived from Hot Springs. A truck carrying a large cage or crate secured to the chassis, was backed against the chute and the actual loading went forward without delay. Strange as it may seem the process of loading is a minor detail and readily accomplished. It consists of cutting a load of four or five animals (depending on size) into the small pen at the foot of the chute, and then carefully working these into the crate. Occasionally one will become stubborn and sulk, refusing to move when but part way up the chute, or will attempt to turn around and get hung up, requiring help; but ordinarily it is the work of but a few moments from the time the truck is in position until the man on top drops the end gate on the last elk in, calls out, "All set. Bring on your next wagon."

Unloading from trucks to cars, merely reverses the process and is as little or less labor. Some loads will hesitate to leave the cramped quarters of the crate with which they have become familiar on the long ride, for the unknown terrors of the strange interior of the car, but when the first finally decides to make the transfer the rest follow like sheep.

It is necessary for a man to accompany them on their railroad journey, to feed and water them enroute. When Middleboro is reached, they are again loaded on trucks and hauled about five miles to their permanent home.

The elk is a migratory and gregarious animal. In their native haunts and where sufficiently numerous, at certain seasons of the year they form bands of from a hundred to several thousand animals. In winter they seek the lower more open grassy slopes of the foothills or even open plains country; but during the summer are to be found at or near timberline where the cool breezes and mountain lakes make ideal conditions under which to fight the savage greenhead flies that make life miserable for all livestock during July and August.

How these elk will thrive under the intense heat of mid-summer in the low country along the Atlantic seaboard, is yet to be demonstrated. That they will live is proven by the presence of elk as individual specimens to be found in Municipal and private parks throughout New England; but park elk are usually light of weight even when not actually poor in flesh as compared with wild elk matured on the cool slopes of the Rockies! The failure or success of this enterprise will depend largely on the quality of meat produced. It may also prove that elk will survive and fatten on a diet of straight browse feed; but after all it is an experiment with an uncertain result in prospect which will be watched with keen interest by sportsmen and all those who have had opportunity to

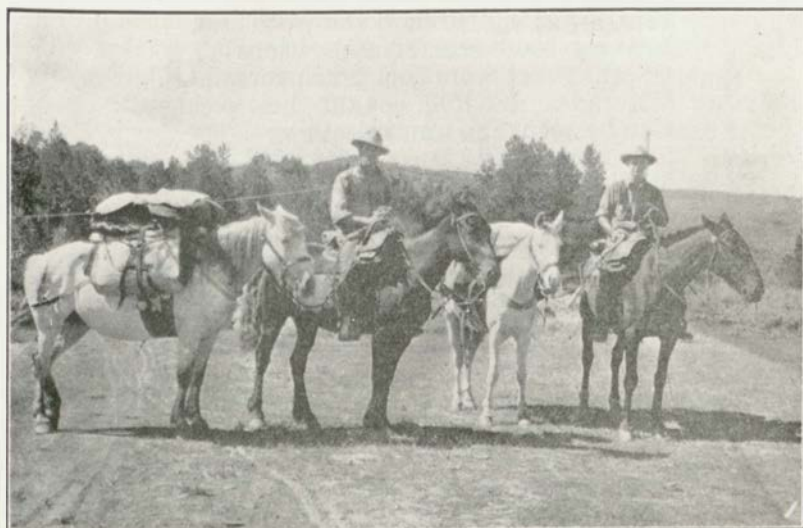
study these interesting big game animals under year-long conditions on their native heath.

Whether or not this newest innovation in growing meat for the market proves financially successful, and not excepting the former movement of the Pablo buffalo herd from the Flathead Indian Reservation in Montana to Wainright Park in Canada, the Jones Brothers of Middleboro, Massachusetts are staging the biggest play of its kind ever pulled off in this or any other country. Our hats are off to them.

HIS STRONGEST FRIEND

It lies in calm, relaxed, repose
Turned on its side in sheer exhaustion;
It lies, a plaything of man's whims
The victim of his moods and fancies.
I marvel at its dog-like fidelity,
Its ever responding, soothing devotion;
It is a necessary thing for inspiration,
This pipe that serves its forester.
Opal Frances Yochelson.

AN EXTENSIVE RECONNAISSANCE CREW



Two experienced men working on horseback will cover about 250,000 acres on an extensive basis in a four months season at an average cost of about one cent per acre for the completed management plan.



LIGHTNING STARTED IT—30 MEN AND A RAIN FINISHED IT

DEMON

Fire, sweeping through the woodland,
Leaving black-scarred apparitions
Of what once were cool green forests
Where the woodfolk sought their pleasure
Can be seen, and upward rolling
Shooting puffs of venomous smoke.
While toiling, with unceasing efforts,
Asking only for strength to continue
Are the men, truly war-spirited heroes
Fighting the demon,—FIRE!

Opal Frances Yochelson.

METEOROLOGY AND FOREST FIRE PROTECTION

By H. T. Gisborne

Northern Rocky Mountain Forest Exp. Station

Foresters in western Montana are rapidly becoming meteorologists of a better than amateur grade. Their business of growing and harvesting timber is forcing them to acquire this new knowledge because the greatest enemy of their business is fire, and the chief natural control of fire is the weather.

The annual fire season in this region begins, peaks, and ends in accordance with the weather. The experienced forest ranger or supervisor consequently looks up with an intelligent eye, trying to foresee the resultant degree of fire danger by observing the cause, rather than waiting till the effect overwhelms him in the form of an epidemic of fast-spreading forest fires. Using the behavior of existing fires as the only criterion of existing and probable danger has been found to be an altogether too expensive policy, the safer method being to prepare for war in time of peace, with one eye on the storm clouds.

There has been no information available in the past, however, which the man in the woods could use to interpret weather into fire danger. Hot, dry weather was known to mean high danger, of course, and cool, wet weather generally meant safety, but what constitutes hot, dry weather, and what is cool, moist, and safe were questions which could not be answered in detail. The results of forest fire research conducted by the Northern Rocky Mountain Forest Experiment Station are beginning to provide some of these distinctions which appear usable.

This investigation of the meteorological factors of fire danger has been conducted on the theory that the weather controls the amount of moisture in the forest materials, and that the moisture content of the fuels largely controls their inflammability. A series of measurements of the amount of moisture in five important classes of fuels; twigs, the top layer of duff, dead branchwood and slash, the full layer of duff, and the outside half inch wood on windfallen trees, has shown that during the past four fire seasons the top layer of duff generally had a little more moisture than twigs, about the same as slash, and a little less than the outside wood on windfalls. The moisture content of the top layer of duff therefore has been studied in relation to duff inflammability, and to the various weather elements. By determining the degree of duff inflammability according to the amount of duff

moisture content, and by finding the average duff moisture content to be expected in accordance with atmospheric temperature, humidity, etc., it is possible to measure the prevailing weather and deduce the most probable degree of inflammability prevailing at that moment. Likewise, the weather forecasts can be translated more accurately into terms of probable inflammability. One criterion of fire danger is thereby provided, whether or not fires are burning. It is no longer necessary to wait for fires to occur before forming a reliable opinion of their prevailing and probable rate of spread.

Our measurements have shown that precipitation is the only weather element which completely eliminates fire danger in this region. The daily measurements of duff moisture content during the past two fire seasons—the only season completely covered by daily measurements—have never shown a condition of non-inflammability, indicating absolute safety, except following rain or snow. Low temperatures and high humidities have lowered the degree of inflammability but they alone have not yet been found to add enough moisture to the fuels so that they changed from medium, high, or extreme inflammability to a non-inflammable condition. At least six-tenths or more inches rain evenly distributed throughout a period of 48 hours is needed to produce complete saturation of the duff, but any rain of 0.20 inch or more in a 24-hour period is recognized as extremely beneficial, and sufficient to allay fire danger temporarily.

Rain is more or less periodic in occurrence, however, whereas temperature, relative humidity, and evaporation are always with us. Temperature and humidity also lend themselves to instantaneous measurement, and evaporation is commonly measured for each 24-hour period. These three weather conditions, an element in the case of temperature and combinations in the case of relative humidity and evaporation, have been studied in relation to duff inflammability so that measurements of these weather conditions can be translated into terms of fire danger, as follows:

	Generally Safe	Slightly Dangerous	Dangerous	Extremely Dangerous
Temperature	55° or less	56 to 70°	71° to 85°	Over 85°
Relative Humidity	Over 70%	46 to 70%	26 to 45%	25% or less
Evaporation by Forest Service Evaporimeters ..	6.0 gm. or less	6.1 to 10.0 gm.	10.1 to 14.0 gm.	Over 14.0 gm.

Such a classification is most dependable only during the period June 1 to September 15 each year, and marked exceptions to the general rule are found at times when rain affects the results. The classifications given are based on results in the western white pine timber type in this region and may not apply at all to other timber types with different climate. During the early spring in this region the actual danger usually is not as great as that indicated in the above classification

because then many of the fuels are still wet from the winter rains and snows, and have not yet reached a condition of equilibrium with existing weather. Late in August, and in early September conditions are apt to be slightly more dangerous than indicated by these generalities.

Wind is well recognized as a very important factor affecting fire danger, the spread of fire, and the inflammability of materials in northern Idaho and western Montana. Three possible effects of wind should be anticipated by forest officers. The first effect is the more rapid drying of forest materials when the wind velocity is high. Wet fuels likewise will retain their moisture much longer if the wind is gentle. The second effect is a mechanical action on existing fires. With little or no wind much of the heat of a fire goes straight up into the air, being lost in so far as adjacent materials are concerned. Let a wind occur, however, and the flames are levelled over toward nearby fuels which are then heated to their ignition temperature much more rapidly, and the spread of the fire accelerates in that direction. The third effect of wind is on the supply of air and oxygen to support combustion. Even in a furnace or firebox some of the air supplied to the fire escapes without being used. In a forest fire conditions are such that only a very small proportion of the oxygen can be used in combustion. An increase in wind velocity, therefore, increases the amount of oxygen striking the burning fuels and assists the process very materially.

The effect of wind on the spread of fire has been studied by Show, in California, with sufficient detail to obtain a measure of different rates of spread of fire resulting from the levelling of the flames and the increased supply of oxygen. Show found that when fires burned through similar volumes and arrangements of fuels having similar moisture contents, the rate of spread of the fire varied about as the square of the wind velocity. Hence a fire in a four-mile wind can be expected to spread about four times as fast as one in a two-mile wind, instead of only twice as fast.

The exact meaning of the terms used by the U. S. Weather Bureau in forecasting wind velocity must be remembered if a forest officer is to utilize this information dependably. Very few people realize the difference implied by the Bureau when they predict a light wind one day, gentle the next, and moderate on the third day. As shown by the following table, such predictions indicate that fires will spread about four times as fast the second day, and nine times as fast the third day, compared to the first.

In using the ratings of rainfall, temperature, humidity, and evaporation, previously given, certain meteorological instruments are necessary. Rain gauges are available at many forest stations, but they can be made of a simple tin can suitably exposed, and used to advantage where better ones are



AN OLD LOOKOUT STATION

Terms Used in Forecasts	Wind Velocity in Miles Per Hour
Light	7 or less
Gentle	8 to 12
Moderate	13 to 18
Fresh	19 to 24
Strong	25 to 38
Gales	39 to 54

not obtainable. A measurement based on the actual depth of rain collected in a homemade gauge is usually far more accurate than an estimate, entirely unsupported by any measurement. Forecasts of the time of occurrence of rain are obtainable in this region from the Weather Bureau or the Forest Service, and are far more dependable than estimates based on the mere observation of a limited horizon. It is desirable, however; to give due consideration to local conditions in deciding upon the degree of dependability to be placed upon each forecast of rain.

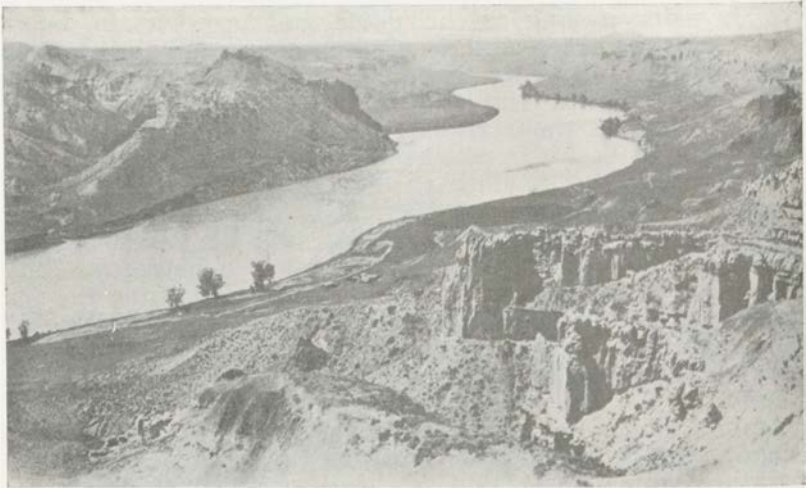
For measuring temperature and humidity, and in using forecasts of these conditions, one instrument, a sling psychrometer, is absolutely essential. Measurements with this instrument will show both the prevailing temperature and humidity, and will thereby permit the use of the ratings of degree of danger previously given. These measurements also will provide a basis for interpreting the weather forecast, which usually employs comparative terms, such as "warmer tomorrow with much lower humidity." The degree of danger to be anticipated tomorrow therefore depends upon measurements of the weather today.

In using a sling psychrometer there are certain details which must be observed if accurate measurements are desired. First, the cloth covering of the wet bulb thermometer must be thin and it must be clean so that water will evaporate quickly from it. Second, the instrument must be whirled evenly without jerking, a desirable rate being from 150 to 200 revolutions per minute. The readings should be taken in the shade of some object whenever possible. The third, and most important point, is to whirl the instrument until the lowest possible reading of the wet bulb thermometer has been obtained. (This assumes, of course, that the water used in moistening the wet bulb was at about air temperature). When the lowest wet bulb reading is obtained both thermometers are read and the psychrometric tables are employed to compute the relative humidity. The experienced operator who is confident of the accuracy of his relative humidity determinations is always certain that he has obtained the lowest possible wet bulb temperature, which is the temperature of evaporating water.

Evaporation measurements are not being made at very many forest stations as yet, because the instruments necessary are somewhat complicated and expensive. Such measurements serve a valuable purpose, however, because they integrate in one figure the combined effects of temperature, humidity, wind, and sunshine for a definite period of hours. The principal weakness of these measurements lies in the fact that evaporation is measured from a continually saturated surface, whereas the forest materials are seldom saturated. Hence, it often happens that when the evaporimeters or atometers show the greatest evaporation, forest duff, twigs, slash, etc., may be so dry that they will show almost none.

Regardless of the weather element measured, and even when all of them are measured and recorded by modern and expensive instruments, there are times when the most inexperienced forest officer will refuse to believe that the degree of inflammability is the same as that indicated by the weather. Such conditions are the marked exceptions to the general rule or relationship. If the reasons for such exceptions are sought with diligence, however, the causes can be explained. The dependable use of weather measurements as indices of inflammability demands the use of thorough observation, logical reasoning, and sound judgment. Measurements are of great value, however, in controlling the observations, analyses, and opinions formed so that action may be taken with much more assurance of efficiency. The chief reason why the forester is now turning to meteorology for assistance is to make his forest protection more efficient; to be prepared before the emergency occurs; and to retrench and play safe only when conditions actually warrant it.

JOIN THE RIFLE CLUB



BAD LAND

ONLY GAME FISH SWIM UP STREAM

It's easy to drift as the current flows:

It's easy to move as the deep tide goes;
 But the answer comes when the breakers crash
 And strike the soul with a bitter lash—
 When the goal ahead is an endless fight,
 Through a sunless day and a starless night,
 Where the far call breaks on the sleeper's dream,
 "Only the game fish swim up stream."

The spirit wanes where it knows no load;
 The soul turns soft down the Easy Road;
 There's fun enough in the thrill and throb,
 But Life in the main is an uphill job;
 And it's better so, where the softer game
 Leaves too much fat on a weakened frame,
 Where the far call breaks on the sleeper's dream,
 "Only the game fish swim up stream."

When the clouds bank in—and the soul turns blue—
 When Fate holds fast, and you can't break through—
 When trouble sweeps like a tidal wave,
 And Hope is a ghost by an open grave,
 You have reached the test in a frame of mind
 Where only the quitters fall behind,
 Then the call breaks clear on the sleeper's dream—
 "ONLY THE GAME FISH SWIM UP STREAM."
 Author Unknown.

WHY IS A GRAZING MAN?

By Will C. Barnes

"The essential prerequisites of an embryo grazing official." That's the subject given me for an article in the forthcoming issue of the Forestry Kaimin. And it's to be done in a thousand words—count 'em—one thousand words. Boys, it simply can't be done. That title calls for a whole book,—say fifty thousand words. No less.

I have a suspicion, however, that "Why is a grazing man?" is the real question I'm to answer. Briefly, grazing men for our work are like cowboys; they are born that way. In an experience of many years on the open ranges, I discovered that some of the best cowboys we had in the old days were young Eastern boys who, until they landed in a cow camp, had never ridden a horse or handled a rope. We used to say such chaps were born "Chuck full of cow sense."

My work in the Forest Service has satisfied me that our best grazing men are born "chuck full of grazing sense." It's in them some way, and they take to the work as easily as ducks to water. Naturally, one asks, "What is grazing sense?" Briefly, it's a love for and appreciation of livestock and an interest in their well being; plus an inquiring mind and a keen observing eye. Many of our best men in the grazing work have come from the western farming states. Some way they seem to grow 'em out there, 'chuck full of cow sense." They love animals, and old Mother Nature and the wide open spaces make strong appeal to them. These western boys who have had a good high school education plus several years at one of our western agricultural colleges need only the "grazing sense" to succeed in our work. There they get well grounded in botany, plant physiology, ordinary mapping and surveying, and the courses in livestock that such institutions give. But they don't acquire "grazing sense" out of books or from courses in schools.

In the early days of the Service we used to have what we called "practical field work" with the Ranger's examinations. I once watched a bunch of youngsters take this field work on a forest in California. One of them beat all competitors in saddling a horse and putting on a pack with the diamond hitch. The way he threw that camp plunder onto a horse and flung the diamond hitch over it was a joy. He never made a false move. When it came to naming ten local grasses laid out on a long table, he knew every one of them—a thing I myself didn't. He missed but one or two of the names of a dozen branches of local trees, conifers and broad leaf. He told exactly how many pounds of flour, baking powder, salt, sugar, coffee and bacon would be needed to feed ten men ten days

in the hills. In fact he was almost letter perfect in all these things. His written history, however, showed he had lived about all his life in a large city and for the last ten years had clerked in a drug store. His education was high school—no more. But he loved the woods and flowers, was crazy about horses, and every Sunday he had tramped over the hills near the city bringing home pressed flowers, grasses and limbs of trees which he identified by looking them up in some books he had bought. For several summers he spent his two weeks' vacation at a small mining camp in the mountains where he added to his stock of information on birds, flowers, grasses and trees. From an outfit packing supplies to a mine he learned the mysteries of the diamond hitch and how to saddle a horse. He was away behind all the others on a lot of the other questions asked, but he "got by" because of his record in the practical things where most of them fell down. Cursed with a curiosity to know the "Why" of everything, possessed of a receptive mind, and full of tact and "cow sense," that chap made good in the grazing work.

Then I knew another young fellow who came out of college very creditably and passed our examination for Grazing Assistant without much trouble; but when he got on to our work he failed dismally, simply because with all his knowledge he didn't have a bit of "grazing sense." He was a poor mixer, "flocked to himself" too much, lacked enthusiasm and thoroughness in his work, and while always looking for something new to do never quite finished up the job he had on hand.

These two cases represent the extremes and are cited merely to show the wide range of conditions under which our grazing men reach us. It goes without saying that all other things being equal the man with a college education is the most likely to succeed and makes the best material for our work. That's a fundamental proposition.

The essentials of a good grazing man as I see them are a good student, a close observer, an analytical mind, a love for animals, a cooperative spirit which means a good mixer with his comrades around camp, and a desire to do whatever one undertakes in a thorough businesslike manner. Better a few things done well than many rushed through and not finished.

Last of all you may ask, "What's grazing sense?"

Well, briefly, it's just plain ordinary "common sense." If you haven't it, no books can give it to you; and by that same token if you haven't it you can't be a successful grazing man.

THE DEVELOPMENT OF GRAZING MANAGEMENT PLANS

By W. R. Chapline, Inspector of Grazing, U. S. Forest Service

Scientific management has come to be recognized as essential in all lines of industry. It is equally important that the owner of grazing land and the grazier develop plans for the use of the land which will insure a stable and profitable livestock industry. Furthermore, if the land is in government ownership, and a considerable part of the grazing land still is held by the government, the use of the land for grazing must be coordinated with the other uses of the land. Before the creation of the National Forests excessive grazing use was preventing the satisfactory establishment of timber reproduction on many timbered areas. Even now overgrazing on much of the unregulated public domain has so depleted the vegetative cover that the valuable surface soil is fast being eroded away endangering the reestablishment of the protective cover and causing enormous damage to the farm land and irrigation and power developments which lie in the path of the heavily silt-laden floods. Even where overgrazing is not injuring other resources of the land the needs of the livestock industry demand conservative, efficient and economic use of the range by livestock consistent with conservation of the forage resources and with the perpetuation and use of the other resources.

The need for knowing what the grazing resources on the National Forests were and making plans for more scientific management of them was early recognized. In 1910 Mr. James T. Jardine, then Chief of the Office of Grazing Studies, started intensive surveys of the grazing resources and the development of management plans. This work has expanded until now about 25 million acres within the National Forests have been covered by special men, while local officers have covered several million additional acres. Recently a program has been started to develop plans of management on all National Forest areas on the basis of existing information. This paper deals, however, with those grazing management plans prepared from surveys of the resources sufficiently accurate to give a sound scientific basis.

What Is a Grazing Management Plan?

A grazing management plan is to the administration and management of the grazing resources what forest management plans are to forest management. Forest management in this country, however, is an extremely broad term when applied to forest lands such as the National Forests. On these an effort is made to use every resource to its fullest extent consistent with its perpetuation and development and the needs

of the communities adjoining. Since the primary purposes of the National Forests are the protection and development of the timber and watersheds, the use of the grazing resources must be fully correlated with these primary purposes. The protection, development and use of the game on National Forest ranges and the recreational use of National Forests require also that the grazing use be such that there is no detrimental conflict. The prosperity of many communities adjoining the National Forests depends also on the adequate and satisfactory use of the National Forests' grazing resources with a view to economic production and stability which will justify the expenditure of the large sums required for land, equipment and feed to adequately take care of the livestock when off Forest ranges. An adequate range management plan takes these factors into consideration.

A grazing management plan might be likened to the architect's plan for the construction or rebuilding of a house. The architect specifies definitely and clearly in a manner which can readily be understood by the builder the material to be used in each and every part from foundation to roof, the size and shape of the whole and each of the rooms, the placing of the permanent equipment as well as all other features with a view to economy of construction, permanency and convenience. Just so the grazing management plan specifies the resources available and the administration and management for the entire area as well as for each unit of use. It shows the number and class of livestock that will graze, where, when

GOOD RANGE, GOOD CATTLE



A conservative use of the range forage during the period of its greatest value, and adequate distribution over the range as a whole will largely assure efficient production.

and how, for each management unit. The plan is essentially graphic with those specifications which cannot be shown graphically set forth in concise, definite and concrete terms, the whole accurately portrayed in a simple and understandable manner.

Proper conservation and use of the grazing resources consistent with the perpetuation and use of the other resources and maximum production from and stability of the livestock industry involves: (1) Coordinating the use of National Forest ranges with the proper use of the range and ranch property used by the livestock while off the forest; (2) adjusting the class or classes of livestock to the types of range best suited to them; (3) adjusting the period of grazing for each zone or range unit to the growth requirements of the forage and to the period of its greatest value; (4) adjusting the numbers of livestock to the grazing capacity of each management unit; (5) applying such management of the livestock while on the range as will obtain adequate distribution and maximum production of meat and other animal products; (6) applying such systems of grazing as will assure maintenance and improvement of the range forage; (7) adjusting grazing use to aid in fire protection and prevent injury to timber reproduction and watersheds or undue interference with game and other forest uses; (8) eradicating poisonous plants, fencing or posting of poison areas or applying other management of poison plant areas to reduce the present losses; (9) developing watering facilities, constructing drift and division fences, driveways and trails to open up new or under-used range, and other range improvements; and (10) controlling range-destroying rodents and predatory animals.

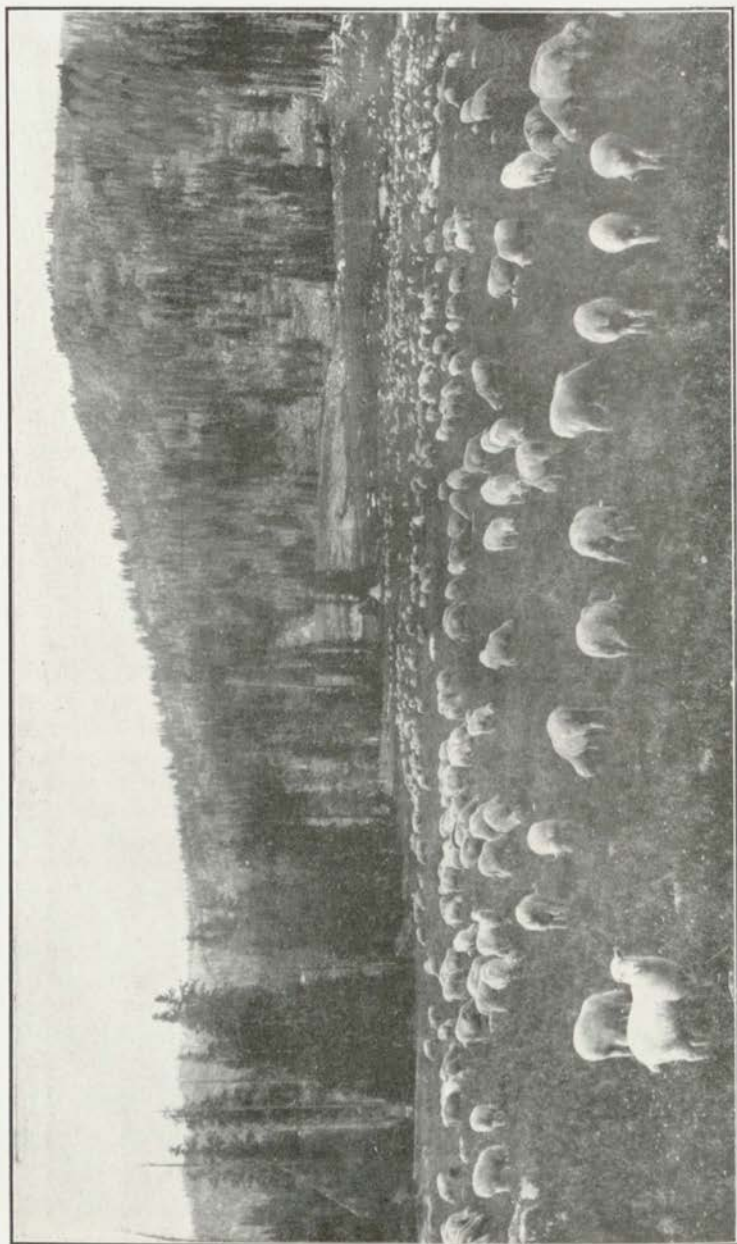
The grazing management plan therefore specifies the principles and objectives and the summarized adjustments for the entire area under consideration and coordinated with this the definite and concrete management to apply on each unit of use based on a careful analysis of the basic information and the practical possibilities of use.

The Basic Information

The soundness and permanency of the management plan will depend on the accuracy of the knowledge of the amount, character and growth requirements of the grazing resources and their relation to the other resources of the land and the thoroughness with which this basic information is analyzed to determine the best methods of management for each specific area. The soundest basis for perfecting range management and utilization is a comprehensive, systematic survey and classification of the grazing resources by specially trained men.

The work should be done with sufficient detail and accuracy to assure the determination of the influence of the essential management principles and practical possibilities

SHEEP GRAZING UNDER THE BEDDING OUT SYSTEM



Under this system sheep are grazed openly and quietly during the day and bedded on a different bedground each night from which they find fresh feed each morning.

of application. A topographic map of reasonable accuracy should be available as a base. The range classification map prepared classifies the area into grazing types showing for each type its location, area, topography, accessibility, amount and character of the vegetation, and condition of the range. In the Forest Service ten main grazing types are recognized: 1. Open grass land other than meadow. 2. Meadow. 3. Untimbered areas where "weeds" predominate. 4. Sagebrush. 5. Untimbered areas where browse predominates. 6. Range in coniferous timber. 7. Areas, other than barren, of no grazing value or of too low value to make their use practical. 8. Barren land. 9. Range in the woodland timber type. 10. Range in aspen. Symbols designating the predominating species or kind of vegetation within these types are used to indicate sub-types or the character of the vegetation on each part. The maps also show the available watering places, cultural features, land status, poisonous-plant areas that have caused or may cause losses of livestock, areas seriously infested with range-destroying rodents, and salt grounds or other features of value in connection with the handling of livestock.

Careful observations and notes are made in the field regarding: (1) the density and palatability of the vegetation in each grazing type, including a detailed list of the species showing percentage of each, as well as all the factors affecting the vegetation and its use, perpetuation and improvement; (2) present conditions of grazing use and the possibilities of adjusting this use so as to correct improper practices and secure the range management desired; (3) general conditions surrounding the livestock industry in the region, including importance of grazing, stability of business, dependence on forest range, comparative commensurability of range with respect to different classes of livestock, and relation of agriculture and public domain and private pasture lands, as well as other industries, to forest grazing; (4) the species of poisonous plants, their location, abundance, effect on grazing use, and known losses; (5) the character, location and permanency of watering places and the number of stock the available water will supply together with recommended development; (6) the need for, location of and recommendations for construction or abandonment of fences, driveways, trails, bridges and other range improvements; (7) the location, acreage damaged, and recommended control methods for range destroying rodents; (8) the number of game animals, adequacy of summer and winter range for them and relation to present and possible future grazing use; (9) the influence of present grazing use on timber production, watershed protection and fire control with desirable adjustments and (10) such other matters as have a bearing on grazing management.

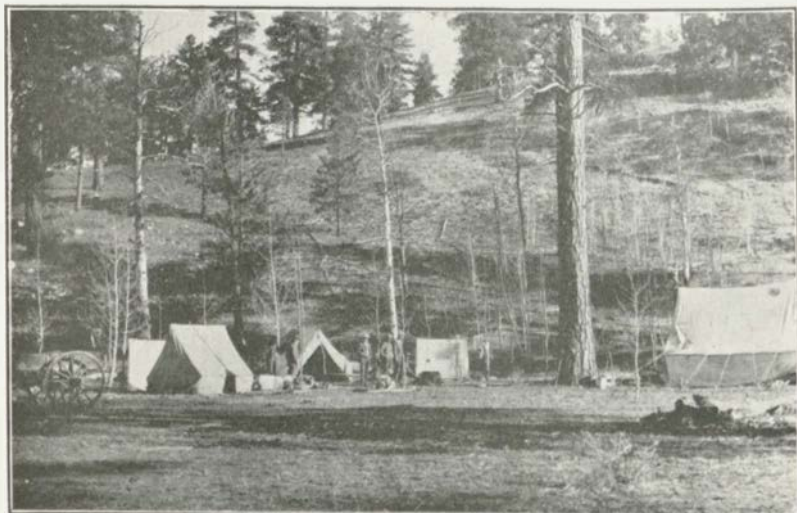
The Management Plan

Since the prime purpose of the management plan is to show clearly what the grazing resources are, their relation to other resources, and how they may best be used, all economic influences considered, these features are always kept in mind throughout the collection and analysis of the data and the preparation of the plan. The finished plan therefore constitutes the objectives in range management. It is a simple, workable and complete exposition of just what the situation is and the program of management to be applied to accomplish the objectives. Furthermore, it is of such a character that it can be kept up to date with the changing administration and management provided and with the changes necessitated by changing economic and other unforeseen circumstances. It furnishes in addition the basis for the development of more detailed management of each area as the main adjustments are made and as the range users come to realize the importance of intensifying the management.

All material which can be presented graphically is shown on the map or overlays while the written part defines the specific action necessary in those adjustments and management practices which may not be understood in the graphic part.

The base map shows the forage resources and the more permanent features that affect the use and maintenance

AN INTENSIVE RECONNAISSANCE CAMP



On intensive work a crew of five men will cover about 250,000 acres in a four months season at an average cost of about two cents per acre for the completed management plan.

of these resources. In addition to topography and culture, on it are placed the grazing types in color, the natural management units and the surface acreage and forage acreage of each type, section and natural topographic unit. The overlays give, so far as can be represented graphically, the data of a more or less temporary character which are needed for managing the range and handling the livestock. This includes the allotments and divisions, zonal and other distribution units, number and class of livestock, forage acre allowance, grazing season on each part, utilization and distribution plan, salt grounds and amount of salt and period of use for each, range improvements and any other features which have an important bearing on the management.

The written part outlines the objectives and the specifications of management which cannot be shown graphically or in tabular form, and coordinates the whole into a summarized statement of the main adjustments and management practices approved. For the forest or large unit as a whole it coordinates the use of forest range with the best economic conditions of the livestock and ranching industries of the region. It specifies the main objectives for the forest in numbers and classes of livestock to be grazed; in the general periods of grazing; in the general distribution of livestock especially changes on those areas where better protection to timber growth, watersheds, game, recreation or other uses is important; in the management of the forage and of the livestock; in driveways and other range improvements; and in other phases of importance on the Forest as a whole. In addition to the objectives the main program to accomplish these objectives so as to give reasonably satisfactory management within a few years is outlined. The tabulations show by sheep allotments and cattle divisions such features as the surface and forage acreages, the authorized, permitted, actual and approved numbers and seasons and the forage acre allowance for both government and private land open to grazing of permitted livestock.

The principal features of management for the grazing units such as sheep allotments or cattle divisions are largely shown graphically and only enough written specifications are given to assure a satisfactory understanding of the approved management. The specific plans for salting or handling of livestock, the allotting of areas to individuals, eradicating poisonous plants, range-destroying rodents and predatory animals, and features which change from year to year are usually left to be developed on the ground by the ranger in accordance with the main management plan provisions.

Supporting Data and Analysis

In preparing the management plan the data collected in the field work are analyzed and summarized. The analyses of observations on factors influencing carrying capacity and

the forage acre allowances are of particular importance in this respect. It is usually necessary to study this basic information to clearly understand the reasons for the management plan provisions. The inclusion of this material in the management plan proper, however, would make it voluminous and might prevent clear conception of the specific administration and management approved. In order, therefore, that it may be available for future check of the work and especially for review by later forest officers it is assembled in as concise form as possible and added as a separate part or appendix of the management plan.

Application of the Management Plan

The value of a grazing management plan is largely governed by the results obtained in its application. The failure to apply some essential feature in grazing management may prevent satisfactory results from the application of other features of the plan or necessitate such excessive adjustment in them that livestock production becomes uneconomic. Plans on the National Forests, therefore, are carefully analyzed by the forest officers concerned in the development and application before approval by the District Forester. Once approved they are recognized as the basic range administration and management to apply until modifications are approved. Each year, therefore, the Supervisor and Rangers set up their yearly objectives in accordance with the management plan provisions and prepare a more or less detailed plan of action for accomplishment of these objectives.

The success of the application of the plan depends to a considerable extent on the willingness of the grazing permittees to cooperate in accomplishing its provisions. While much can be done by individual conference, especially on the ground best results are ordinarily obtained by working out necessary adjustments with the advisory boards of permittees associations.

Finally the most essential requirements for application of a grazing management plan are a knowledge of the management principles, and field supervision and inspection sufficient to obtain as satisfactory application as the practical possibilities of us will allow and to check the results of application with a view to recommending desirable changes in the plan's provisions.



BURNING BRUSH IN THE FALL

SLASH DISPOSAL IN THE INLAND EMPIRE

By H. L. Whiting

In the preparation of this paper on slash disposal in the Inland Empire region, the subject has been divided into four parts, as follows: Reasons for disposal, advisability of disposal, determination of costs and a summary. These divisions will be dealt with in order.

Reasons for Disposal

In this region fire protection is the most urgent of forestry problems. Fire protection is estimated to be 80 percent of forestry for District No. 1. Why study forestry and conservation if we are to permit the forest areas to burn over before the possibility of harvesting a crop from existing reproductions?

It is generally accepted that a logging slash is the most dangerous fire risk in this district and for this reason alone, slash disposal has been resorted to as the only effective means for reducing this hazard; a more favorable stand of reproduction is a result of slash disposal, but has no part in determining whether an area shall be piled or burned or left in slash. The Forest Service has borrowed liability and risk from insurance terminology to express the chance of loss by

fire. For the purpose of this paper, a logging slash with a southwest exposure adjacent to a railroad will be considered as the highest of fire risks. That this area will burn is nearly certain unless preventive measures are taken and once aflame it is humanly impossible to control it until the entire slash has been consumed. As we can look for no miracles to furnish a solution for the problem, common sense backed up with a policy of compulsory slash disposal on all lands, public and private should be applied if the future welfare of the country is to be considered.

At the present time, lumber companies are little interested in future timber supply, being mainly concerned with securing the last dollars worth of timber in existing stands at the lowest possible cost. Reproduction and mature stands are ruthlessly destroyed and left in such condition that fire runs over the land year after year consuming the duff and humus to such an extent that it will not support even a crop of grass.

Large areas in Michigan and Wisconsin are examples of long standing while more recent examples may be found in every timbered area in the West. It is up to foresters employed by the Federal Government and the states to see that the remaining timbered areas are not left a barren waste.

In the government contracts for the sale of timber, a clause is inserted to the effect that the contractor cooperate to a stated amount for the disposal of the slash resulting from his operations. However, if this slash burns up prior to its having been piled and burned, the operator is automatically released from any liability and the amount deposited with the Forest Service for brush disposal is returned to him. In this case it is an advantage for the logger to see that the area catches fire, thus relieving him of the expense of brush disposal. This situation should be mended.

To those questioning the advisability of slash disposal is quoted the following from The Idaho Forester by Mr. I. H. Nash, Idaho State Forester:

"Many who have followed the old methods of waste and destruction still contend that this slash disposal clause cannot be profitably met. Our answer to this is: we have been enforcing this requirement in all our sales since 1916 and our stumpage is still in demand at a higher price each succeeding year. The same holds true for the Forest Service which makes similar requirements."

Every slash in which the forest litter is not disposed of, constitutes a real menace year after year to all the surrounding timber lands. The reduction of fire risks alone more than justifies the cost of disposal, in reality the entire costs could well be charged to fire protection as it is nearly certain that this cost could be directly subtracted from the amount required to fight fire, in say a ten year period.

(Continued on Page 81)

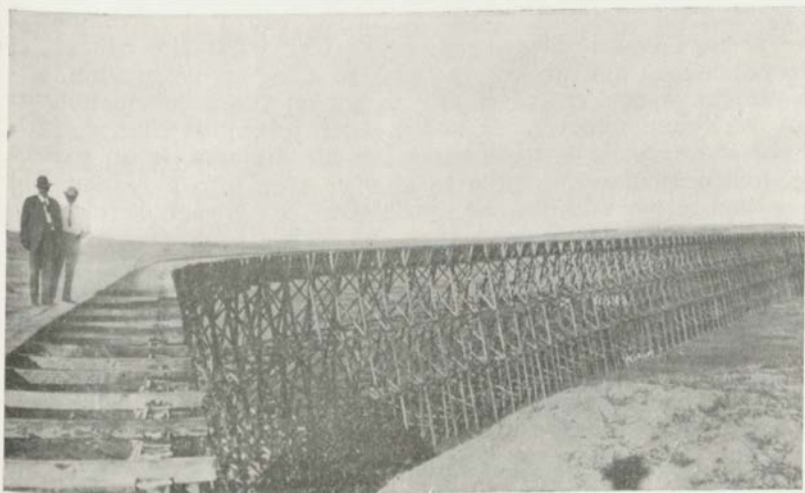
THE FORESTER IN THE LUMBER INDUSTRY

By Geo. E. Weisel

The forester in the lumber industry of the United States is, generally speaking, a new factor and really in the experimental stage only. There have been some efforts made by some of the larger operators, in the last few years, who own large lumber tracts, to experiment with the reproduction of timber on cutover lands, and to study improved methods of logging in order to preserve the young growth. Continuous yield is their aim, thereby making the industry in a given locality a permanent industrial institution. Here is where the trained forester comes into his proper sphere of action.

It is a well known fact that the big salaries are paid in those departments of an industry, which are profit producing. The departments which have to be carried by the profits of the other departments, seldom give much encouragement in the way of financial reward to those men working in that particular department. So it will be with that portion of the lumber industry, covering preservation and reproduction of timber growth. Due to our lumber economic conditions, resulting largely from present methods of timber taxation, timber preservation and reproduction at this period, and for some time to come, is not going to pay dividends.

Yet we must have men who have the vision and the spirit of service, willing to sacrifice the present, who will build up a supply for the future. Largely it will be the college man who will do this, for a broad education will enable him to see the



THE WORK OF THE FOREST ENGINEER

necessity of this step. We must educate his employer as well as the public. His portion is to pioneer in the field of new ideas in lumbering. The first steps have been taken, but really the ground work is hardly broken,—a few efforts made here and there, but nothing general.

No business can continue without showing some profit, for in the long run its bills must be paid and if it is not yielding some profitable return for the efforts put forth and the risks taken, that business will fail. A bankrupt business is not an asset to itself or to the community in which it operates. For this reason, a lumber operation must make money and those men who can so operate it will be successful while those who cannot, and whose ideas when applied to practical operations fail, will be dropped out. All theories must stand the acid test of being a success in their practical application, or else they are cast aside by the successful manager. So it will be with any ideas which a forester may have as to logging, silviculture or forest management in whatever form. The owners of a lumber operation must be enabled to see that the business will either directly or indirectly benefit financially by any method the forester may wish to pursue. He must be able to show them results in dollars and cents. Otherwise they will not be adopted and the forester will most likely be looking for a new job. Under present conditions I would say his opportunities were quite limited and his possibility of success quite remote. This assumption on my part is based on the fact of our still large supply of virgin timber, enormous productive capacity, largely made necessary as a result of our timber taxation methods, and comparative diminishing consumption. The lumber industry ranks next lowest on the list of our great national industries, in its record of earnings.

College training basically, no matter what the course, is to teach men and women to think to a logical conclusion, analyze the situation and finally to act on those conclusions in an intelligent manner. It is too much to expect that a graduate of any college, upon receiving his diploma, is an expert in his particular line, able to at once step into a responsible position either technical or administrative. No school in a four year course will be able to turn out such a product. And the school which leads its students to think it can, is making a grave error. I doubt if it is done in any school of any standing today. More likely it is an idea born in the mind of the individual student, who wishes to think that it is so.

No school is able to give to its students a sufficiently wide curriculum so that it will cover all things that a graduate will require in his chosen profession. The capacity of the student would be incapable of absorbing it in a four year period, even though the school did afford it. More essential is it, that a firm foundation be laid in the fundamental requirements toward producing a mind capable of clear, consecutive,

independent thought. The various technical subjects are infinite and in this complex age, too numerous for any one student to get them all. The years he spends in his vocation, called practical experience, will afford him the opportunity of specializing in his particular line. Always remember that the vocational schools produce skilled workers, but not the skilled thinkers. They have their place for minor jobs, but in the long run it is the trained mind which takes the big positions. Even the lumber business has so many branches, that no man, even after years of effort, can hope to get much more than a cursory knowledge of them and fortunate indeed if he becomes an expert in any one line.

Anyone engaging in a commercial career should obtain in some way a general idea of finance and business administration. It is quite possible that the course is so taken up with other subjects considered more vital, that the student will have to wait until he actually engages in practical effort. No efficient manager but who must have this training at some time or another, in some place or another. Few engineering schools afford such a course, yet I think that the fundamentals of business administration must be had by an engineer of any branch, unless he never hopes to get into administrative work.

The graduate of any college, of any course, is going to be a success or a failure, depending upon himself alone, and what use he makes of what the college has given him an opportunity to absorb in the four years he has spent within its influence. Do not make the mistake of blaming either the school or its courses. (I am speaking of recognized colleges of standing). As I said before, no school could possibly give such a broad line of courses, that you would be prepared to step into a high salaried position and fill it acceptably. It is impossible. You are asking and expecting too much. You as a new graduate, have not yet given enough of yourself to the world, to be able to obtain so much. Years of intelligent thought and effort, patience and perseverance, will pay for that and only that.

More and more we find evidence that the trained mind, when coupled with practical experience and **equal native ability**, will make the more successful man or woman. And it is being found true in numberless instances in the lumbering business. It is but a few years ago that in the logging end particularly, it was found necessary to employ trained engineers. In the past, experience only was considered necessary. But that was because logging was a simple business, while now it has become a highly technical proposition, requiring great engineering skill. And having engineers, it has resulted in bringing in men who applied intelligent trained minds, accustomed to research, bringing out new ideas, methods and means of operation. Advanced mechanical appliances replacing hard manual labor, allow higher wages, shorter hours and better living con-

ditions. For years the logging department went on in the same old rut. Suddenly, necessity called in the more trained type of men. Result,—a most remarkable advance in comparatively few years. However, these trained men, with college schooling, had also years of schooling in the College at Practical Experience. These men are now called logging engineers, whose business it is to utilize the forest resources, at a profit if possible. And in the end, that is the main reason for the existence of the forests, to be so used that it will yield to the people what they require at the lowest possible cost. Scenic features for the feeding of the soul are excellent, but preservation of the body still comes first.

There is at this period some distinction between the logging engineer and the forester. It is necessary that they work hand in hand with mutual understanding of each other's aims. There should be a difference in their training in the last two years of college, as it is impossible to give both, all that each requires. The forester, as we now understand the word, is he who will see to the conservation of the present and the propagation of the future timber growth. At present there is not much demand for his services with lumber operators. But as one who had an opportunity to see the forests of Europe, I can see the day, and that not far off, when the lumber industry will need men of the trained forester type. Now we are in immediate need of logging engineers.

COYOTES

Listen to the coyotes yipping
 On that open, moonbathed slope,
 Like the wails of wandering souls
 That have lost their final hope.

Yip-yip-ye-e-e-e-e, Hear their shrill treble.
 Yip-yip-ye-e-e-e-e, Then answering cry.
 Yip-yip-ye-e-e-e-e, That mournful quaver.
 Echoes swell, resound and die.

How to me the coyotes howling
 Typifies the lonesome trail
 When a softly glowing campfire
 Draws aside the memory's veil.

Alban Roemer.

PHILIPPINE FORESTRY PRACTICE

By Vicente Caguioa

The Philippine Islands during the Spanish regime did not pay any attention to their forest resources. There was hardly what we call forestry practice. Truly indeed there was a Bureau of Forestry but it had not done any constructive work which lead to the betterment of the forest conditions of the Islands. The result of this neglect was the wide-open grass lands of today, which are lying idle in the remotest mountain tops of the Cordillera, Sierra Madre and Zambales mountain ranges of Luzon and in the mountains of the southern Islands.

The Forest Officers in those days who were called by the Spanish "Guarda Montes" were employed without technical training and were perhaps appointed through political affiliation. They were only concerned in the collection of the Forest Charges and traveled from town to town without visiting the forest and when by chance they found timber lying in the town or elsewhere, cut, they marked it. Fine was imposed commonly by doubling the forest charges required by law. The worst part was that the forest officers were allowed to collect forest charges. Dishonest forest officers were then tempted to pocket the forest charges collected which happened very frequently. Bribery was not uncommon. There were no strict regulations. The forest Officers were let loose and were at liberty to do as they pleased.

Due to the inadequate laws, which did not provide for the conservation and protection of forest resources, clearing of forest areas locally known as "Caingin" by the people for cultivation was very frequent not only in certain sections of the Archipelago but also in all parts of the country. Here and there they were found even in the very interior of the forest areas. After the clearing, burning followed, which was not only destroying the timber so cut but also leaving the soils bare, subject to erosion and land slides which are influenced by the characteristic rainy weather of the Archipelago. The burning was also a menace to the standing timber bordering the fire in spite of the fact that forest trees in the Islands are not inflammable.

Thus there arises a great forestry problem in the country. Shall this practice be allowed to continue with the aim of creating areas for cultivation or pasture? Or shall this be checked for the future needs of the country? Check was necessary to conserve the forest resources for the future needs of the country. But this could not be done without a well-centralized and properly managed mechanism for the proper management, protection and administration of the forests in the Islands.

Not until the first decade of the twentieth century was

there well centralized control of the forest. Forest laws were then passed by the law-making body during that decade and centralized control was instituted which is now called the Bureau of Forestry of the Department of Agriculture and Natural resources.

To maintain this bureau persons of technical ability were needed so that in nineteen hundred and ten, the legislature passed a bill creating the Forest School in the University of the Phillippines and at the same time authorizing the Director of Forestry to select pensionados out of the High School graduates of the different High Schools of the country to study technical forestry for two years on condition that after graduation each pensionado is bound to serve the government in the Bureau of Forestry as long as he has enjoyed his scholarship in the Forest School. Since then yearly appointments have been made until the present time.

In 1912 numbers of ranger graduates were turned out by the School who were immediately employed by the Bureau of Forestry. Since that year there has been an increasing number of rangers in the service of the Bureau which means that the administrative force is becoming more adequate.

With this growth of the Bureau of Forestry coupled with the more strict enforcement of the Forest Laws together with the promulgation of forest regulation, the problem of checking the crude practice of clearing forest land without due regard of law is being gradually eliminated.

Supplementary to the strict enforcement of the forest laws and regulations, the Bureau of Forestry has been conducting projects of segregating the agricultural lands from the absolute forest lands of the country by creating Forest Zones through proclamation by the Governor General of the Islands. Such proclamation is based upon the recommendation of the Director of Forestry, who has done the examination and survey of the land. Within the Forest Zone clearing of any kind is prohibited and the land can not be disposed of for agricultural purposes. Outside of this forest zone are lands subject to disposition for agricultural purposes in the three following ways: By Homestead, by purchase, and by lease, which are provided in the public land act of the country.

The bases of segregation are numerous. But in general four factors may be considered important and are herein mentioned in the order of their importance: topography, soil, amount of timber present, and needs of the population. Considering the second and third factors of classification, there arises often times great difficulty because the soil may be agricultural in character yet there is a tremendous amount of timber on it. In such cases a certain amount of cubic content per hectare is established as standard. Below this standard the land is declared agricultural, hence outside of the forest

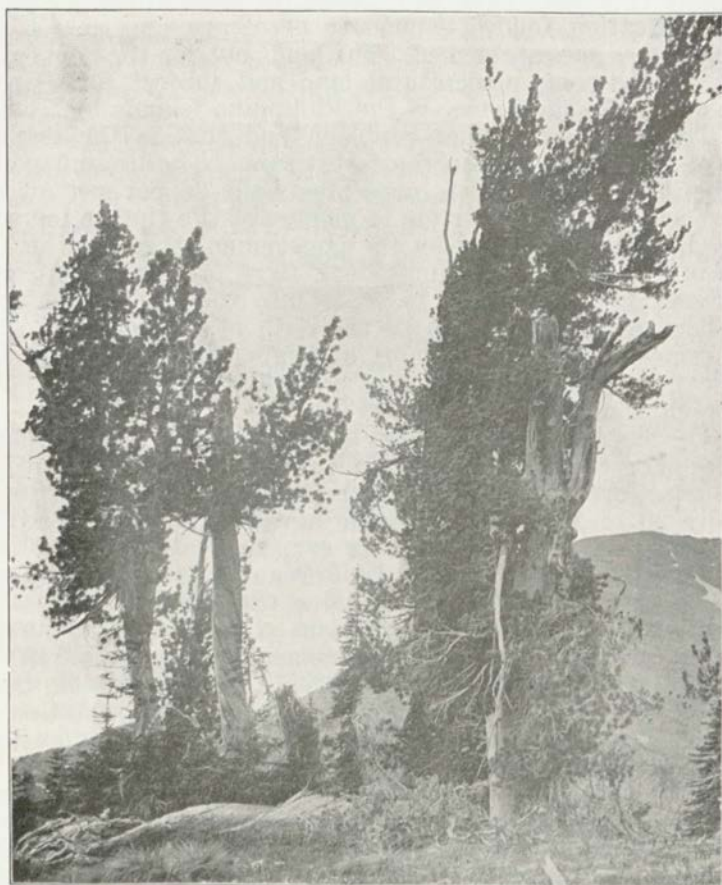
zone. Above this standard the land is classified as potential agricultural land.

By "potential agricultural" is meant land having agricultural soil, but which can not be disposed of as agricultural land inasmuch as the timber thereon can not be cut and removed for wise use at present. However, when the timber is removed according to law thereby opening up the land, then and only then such lands are opened for agricultural purposes. Reclassification follows whenever necessary and new forest zone corners are established. The lands outside the new forest zone lines become agricultural land and subject for disposition under the land laws of the Philippine Islands.

There arises another problem, and that is the disposition of the timber within the forest zone. The present policy of the government which owns practically 96 per cent of the forest area of the country is to dispose of the timber for wise use. Licenses as issued by the government through the Bureau of Forestry to any individual, firm, or corporation, who expresses his willingness to enter into the timber business. The license agreement defines the right of the licensee to cut and remove a certain amount of timber products from the public forest in a definite area according to the forest laws and regulations.

The licenses are grouped into two kinds: the ordinary timber license and the concession license. The former is subject to renewal every year while the latter is subject to long term usually 20 to 25 years. Specific agreements are entered in the license between the firm or company legally capitalized and the government through the Bureau of Forestry, who will from time to time supervise and examine the concession areas to see whether the laws and regulations stipulated in the agreement are properly followed. Particular attention is paid to the close utilization of the timber to avoid wasteful cutting. Serious deviation from the stipulated rules as well as violation of the forest laws and regulations will lead to the imposition of a heavy penalty prescribed by the laws and regulations.

To facilitate the supervision and examination of these licenses totalling more or less than 5000 as well as the management and protection of the forest from encroachment and smuggling of timber by timbermen in the public forest, the entire Islands are divided into districts each headed by district forester aided by numbers of rangers. Each district ranges from 3500 square miles to 31,000 square miles.



TIMBER LINE

EDITORIAL

COMMENT

AND

SCHOOL

NOTES

IN APPRECIATION

The editors of the 1926 Forestry Kaimin wish to express their appreciation to the contributors who so willingly prepared the articles published herein, without which this publication would have been impossible.

ATTITUDE

The way a student works and acts while at school is a pretty good indication of the way he will work at his job.

CRITICISM

It is sound policy never to vindictively criticise anyone when speaking to another. If you have real cause for bearing a grievance, as a gentleman you should first settle with the person you are criticising. Perhaps then a better feeling will ensue.

In the past and even to a great extent at present it has been the popular indoor sport of the forester to berate the lumberman for his wasteful methods of cutting.

Apparently the forester is now beginning to realize that the lumberman was no waster from constitutional orneryness but because it was an economic necessity for him to log as he did. He was right. He could not put on the market what the public would not purchase so the only logical place to leave it was in the woods.

Today economic conditions are changed and so too are the methods of the lumberman. He can now afford to utilize smaller and less desirable material. He can now afford to leave the woods in better condition for regeneration and fire prevention, and—as the lumberman sees these new conditions he is taking advantage of them.



AROUND THE CAMP FIRE

THE METEOROLOGICAL STATION OF THE FOREST SCHOOL

By L. A. Merryfield

The Forest School of Montana is now equipped with a complete meteorological station, which, not only makes it possible for students to become familiar with the use and care of these instruments, but also affords an excellent opportunity for them to carry on ecological and climatological investigations.

The station is located in the Forest School nursery, where a large number of the important timber and shade trees of the United States are being grown from seed. This station gives the student an opportunity to study their germination, growth and development under climatic and soil conditions of which he has a complete record. He may, then compare his results with those of the same species grown under different conditions and draw conclusions which may be of great value to future work along this line.

The instruments are all of the very best type and design for this kind of work, therefore the records will be accurate and authentic.

The Station:

The station comprises: wind direction and velocity instruments, sunshine duration transmitter, rain gauges, station barograph, hygrograph, soil and air thermographs, maximum and minimum thermometers, evaporimeters and sling psychrometers.

The sunshine, wind and rain instruments are attached to a quadruple recorder which is electrically operated and is located in the silviculture laboratory some three hundred feet distant. The current is supplied by means of primary cells in order that a constant and even flow of electricity may be

supplied so that there may not be any interruption in the records.

The wind recording instruments consist of an eighteen foot standard weather bureau tower of steel construction on top of which is mounted the wind vane. When the vane is turned by action of the wind contact is made in a steel box at the base of the tower. The contact will be made at which ever points coincide with the direction the vane is pointing, this closes the circuit and the direction is recorded in the laboratory.

The velocity is measured with a standard "Robinson cup Anemometer" which is located fourteen inches below the point of the vane. The wind catches the cups and causes them to rotate a shaft which operates the mechanism at the base, the wind velocity is then recorded in the silvicultural laboratory on the same record sheet as is the wind direction.

The rainfall is recorded by an electric-transmitting rain gauge of approved pattern. When one one-hundreth of an inch of rain collects in the tipping bucket, it tips emptying its contents and exposing a dry side to catch the next hundreth inch. At each tip of the bucket contact points are closed, which closes the circuit and the impulse is sent into the quadruple recorder where it is recorded.

The sunshine duration transmitter is located on the same wire as the rain gauge, but make a distinctly different mark on the record sheet. In this instrument, platinum wires are fused into the center of the thermometer column and when the mercury is forced up the constricted tube by the expansion of the air in the black, lower glass cylinder, contact is made with the platinum wires and the recording pen immediately begins to record the sunshine, as soon as the sun goes under a cloud the mercury retreats back toward the black bulb and the contact is broken.

The Instrument Shelter

This is of standard "Weather Bureau" construction and houses the soil and air thermograph; the hygrograph; the station barograph and a maximum and minimum thermometer.

The soil and air or distance thermograph, records on a weekly record sheet the air temperatures and the temperatures of the soil at any depth desired within ten feet of the instrument. The hourly records are traced on the chart by separate pens which use different color inks so the two records may be distinguished. There are two of these instruments so that check readings may be taken. These are very necessary instruments for research work because it is important to obtain a simultaneous record of the temperatures of both the air and soil.

The hygrograph records the relative humidity on a weekly chart directly, without the use of tables or computations. The humidity resisting element is human hair, fifty strands

of equal length being used to each instrument. No other device approaches this peculiar one in unvarying sensitiveness. Subject to neither elongation nor shrinkage changes throughout a long life it will constantly and uniformly manifest the same reaction to moisture and dryness. In conjunction with this instrument there are four "Sling Psychrometers" which may be used to take the relative humidity at any point, these are carried out in the field, when the type of work being done requires that humidity records be taken, as: the effect of altitude on humidity, fire studies and etc. With these instruments it is necessary to have a set of humidity tables.

The station barograph is an instrument which automatically records the air pressure in inches and tenths of inches. This is the type of instrument which is much used in the prediction of storms. A falling barometer indicates an approaching storm and a rising barometer the approach of fair weather.

The maximum and minimum thermometers are used for registering and indicating both the highest and the lowest point of temperatures in a determined period of time. This pair of thermometers are mounted on a board and fastened to the inside of the shelter. The Maximum Thermometer is a mercurial thermometer the tube of which is slightly constricted by a short indentation about one-eighth of an inch above the bulb. The mercury expanding with the rising temperature will force the column past the constriction, but as the temperature becomes lower again, the column broken at the constriction, remains stationary. Its top surface will remain the maximum reading. The Minimum Thermometer employs colorless alcohol as its fluid within which a small black glass double-end index will move to the surface of the alcohol in the column when the thermometer is inverted by hand. As the alcohol recedes in the tube with a lowering of temperature, the index clings to the surface and also recedes. When the temperature rises, the index remains at the lowest point, and this will be the minimum reading for the period.

Evaporation

Evaporation studies are made by use of the "Bates Inter-cellular Evaporimeter" and by the "Livingston porous cup." These are placed on a shelf at an equal elevation with the Anemometer cups so that these studies will coincide with the actual wind conditions of which we have records.

The Bates type is made of nickel and the evaporating surface is not exposed to the direct rays of the sun. This instrument is designed to represent, as near as possible, the actual evaporation which takes place from the under surface of a leaf. The Livingston type is a porous bulb or cylinder fastened in the top of a one liter bottle. The water evaporates through the porous clay. These are both filled with distilled water and carefully weighed, then after a period of time

weighed again and the loss of water is the amount of evaporation from a surface of known dimensions for a known time.

With this set of instruments records may be kept of all the climatological phenomenon which affects plant growth in this region.

The station fills a gap in meteorological work that has long needed to be closed and the records should be of invaluable service both professionally and economically.



THE OUTDOOR EQUIPMENT



THE MONTANA FORESTRY CLUB

By Don Shaw

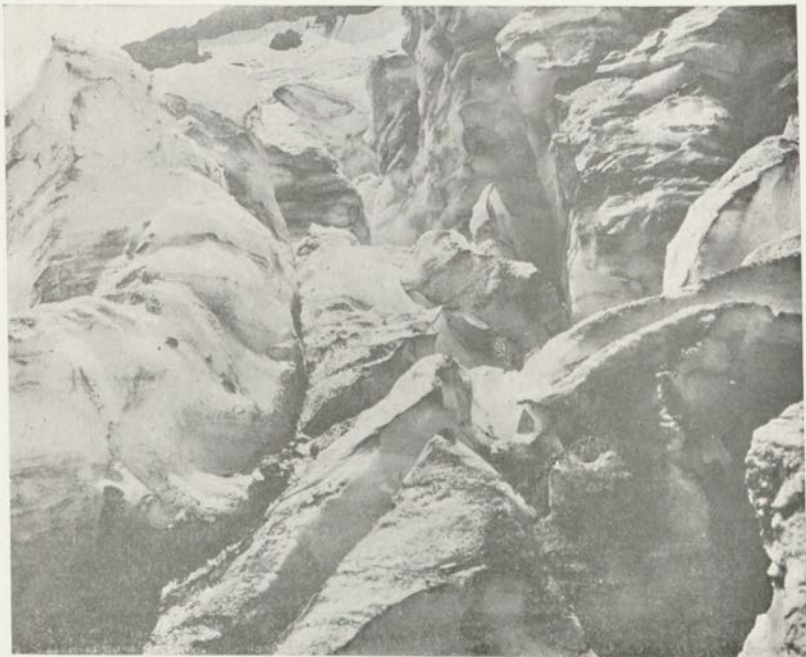
Along in late September of each autumn the Forest School students gather in Pinchot Hall to commence a new year of school. Almost the first question that is heard after old acquaintances are renewed is: "How long before the first Forestry Club meeting?" Some old timer volunteers with, "The Club meets regularly on the first and third Wednesday of each month." From that time until the end of school in June, the Forestry Club holds the center of the stage in the Forestry School.

The first evidence of Forestry Club activity is shown on the opening day of the Fall term, when several upper class men are seen guiding and helping the Freshmen with their registration. This little helpful action is typical of the atmosphere of co-operation which pervades the Forestry Club throughout the year, and which is exemplified in the whole-hearted efforts of the entire Forest School in making a tremendous success each year of an undertaking which would be impossible for any other group on the campus to perform, namely the Foresters' Ball.

The Forestry Kaimin is another project which the Club successfully handles each year. In addition to these, there are the regular bi-weekly meetings, each of which is concluded by entertainment and a feed. The Dual Meet is another Forestry Club activity. There is also a hike and a get-together meeting each fall; a dance early in the Winter quarter to enable the Short Horns to become acquainted with some of the University Co-eds; and late in the Spring quarter a banquet or barbeque is held in honor of the graduating members of the Club.

The past year the Club formulated the policy of being host at joint meetings with other Clubs and organizations on the campus. These joint meetings have proven tremendously successful in themselves, as well as stimulating interest in the Club among the Club members and the campus at large. The meeting at which the Craig Hall girls were guests, will in particular be long remembered by the members of the Forestry Club.

Due to the efforts of President Canfield, with the able assistance of Vice-President Sam Harris and the splendid backing of every member of the Club, the past year has been the most successful one the Forestry Club has ever enjoyed.



An Ice Locked Trail



"'Neath the Bough—
and wilderness is paradise enow."

MOONLIGHT HIKE

By Clarence Spaulding

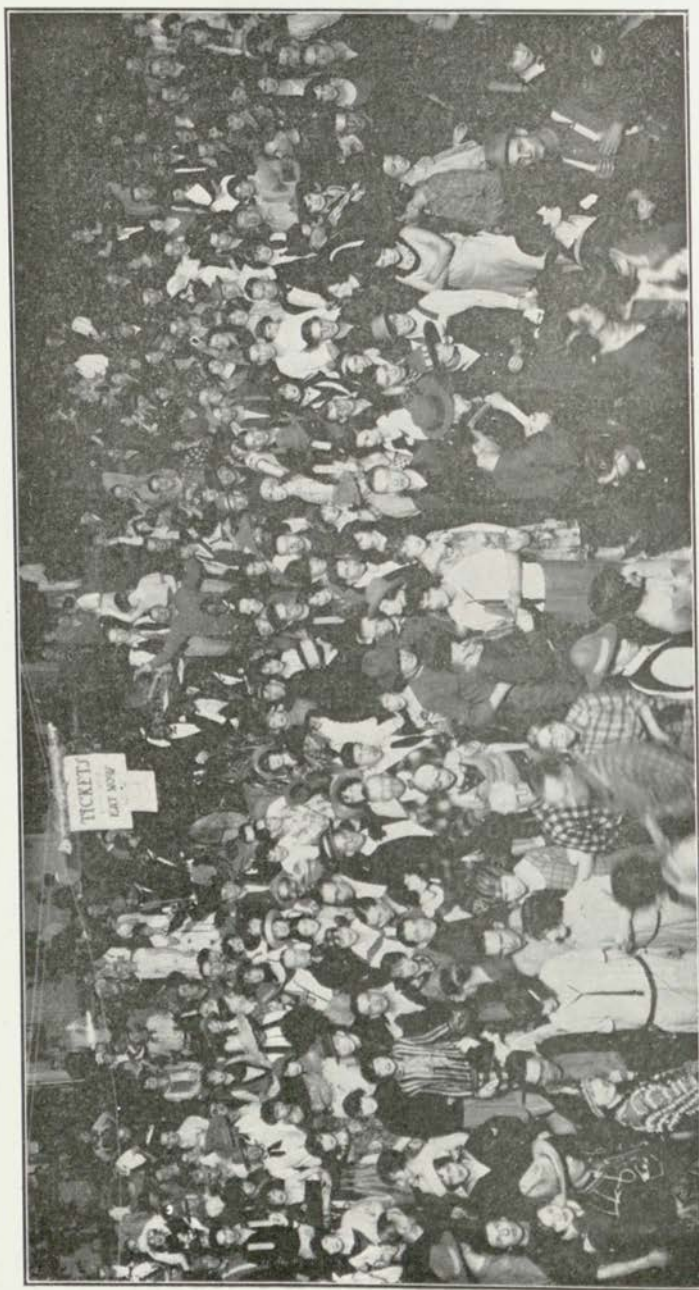
The Forestry Club's Annual Moonlight hike was held October 23, on their picnic grounds up Marshall Gulch.

Only 30 couples attended the hike due to the uncertainty of the weather. The hikers started from Missoula on the seven o'clock Bonner car and got off at Marshall Gulch. The new moon was hidden by clouds, but the mile hike with the lunch was enjoyable. A large pile of wood which had been provided for, was set afire shortly after the arrival of the hikers. The coffee pot was soon boiling on the fire and entertainment had started among the hikers. The slight west wind, light rain and chilly atmosphere kept the hikers continually piling wood on the fire to keep the party lively.

The entertainment consisted of "The Shooting of Dan Magrew," "The Logging of Mt. Jumbo" by Paul Bunyan, recitations, selections and songs. The mystery surrounding "The Alaskan" was solved.

Lunch consisted of hot-dogs, apples, coffee, and roasted marshmallows.

The hike was closed with the singing of College Chums, and the party returned to Missoula at 12. Professor and Mrs. C. W. Cook chaperoned the hikers. This was the first tradition of the Club to be put on and it was very successful.



AT THE FORESTERS' BALL



A CORNER IN THE RANGER'S DREAM OF HEAVEN

THE TWELFTH ANNUAL FORESTER'S BALL

By R. J. Bowers General Chairman

The Forestry Club, an organization of goodfellowship, known as the liveliest organization on the campus, rose to the occasion of the Twelfth Annual Forester's Ball to a man and put it over bigger and better than ever before. Truly, it denoted the noontide, high peak, or any other fitting name for organized effort and accomplishment in the manner in which it was planned and carried to a successful conclusion. The smoothness and swiftness with which every little detail was carried out to the letter, and according to schedule, was favorably remarked upon by the Faculty, the participants, and the club members.

The Forester's Ball has come to be known on the campus as the biggest event of the school year. For the past three years the Forestry Club has been granted the use of the Men's Gymnasium for the event. This has simplified the problem of floor space, and adds grandeur as well, to the decorative scheme of Douglas fir and cedar boughs. Dr. Schreiber has given his word that the Men's Gymnasium will always be available for the Ball as long as the Forestry Club confines its decorations and innovations to such things that will not mar or injure any of the equipment or fixtures of the gymnasium, and that the gymnasium will be promptly and thoroughly cleaned the morning after the ball. To do otherwise would mean the complication of any future "date and place" as far as the use of the gymnasium is concerned for this event. One who has seen the gorgeous effect and setting that the gymnasium affords when decorated for the ball would hesitate before giving it a black eye. In the first place, it would be hard, if not impossible, to find a hall that would even begin to accommodate one-third of the crowd that always pat-

ronizes the "big shindig." This year 350 tickets were placed on sale two weeks before the Ball and all were sold a week later. Fifty complimentary tickets were also given out to patrons, patronesses, and guests. In the second place, where would the Club find a hall with the side rooms, such as the gymnasium affords, that allow us to add such attractions as the "Ranger's Dream of Paradise," and "Ye Old Time Bar-room." In addition, the "Big Feed" has come to stay, and the use of Pinchot Hall, a few steps from the gymnasium simplifies the matter of finding adequate space for this important attraction.

It is well to bear in mind that the general scheme of decoration with boughs can hardly be changed to any appreciable degree, but with the aid of active minds, new minor schemes of decoration can be worked out each year to add spice and novelty to the event. Novelties of decoration and entertainment and new policies of management were inaugurated this year, the latter with the view in mind of making each succeeding Ball the "biggest and best ever." To accomplish this, the chairman of each committee had a lower classman as assistant. This assistant will be chairman of the same committee next year.

This year management of the Ball, by soliciting the aid of Professor Shallenberger of the Physics Department, not only solved, to a partial degree, the acoustic troubles of the large gymnasium, but as well, solved the lighting problem for the orchestra in combination with a decorative effect. Professor Shallenberger designed the "acoustic drop" and was also kind enough to engineer its installation as well as its removal after the Ball. The drop was designed with concave sides flaring upward so as to reflect the sound waves of the music outward and downward to all parts of the gymnasium. One strong arc light directly in the center flooded the orchestra with light and variously colored lights around the drop added to the decorations. The Forestry Club also bought one-third interest in the new boxing ring built for the M. Club and thereby solved the problem of an orchestra stand of adequate size for any moderate sized orchestra.

The Ranger Class, or "Shorthorns," came in for their share of active management of the Ball this year. Due credit is given to Ranger U. J. Post and his assistants for their effective scheme of decoration, and for the promptness with which the gymnasium was swamped, scrubbed and thoroughly cleaned the following morning to make ready for the Varsity basketball game that night.

Ranger Clarence Sutliff, in charge of decorating the "Ranger's Dream of Paradise," worked out an ingenuous scheme of running water representing waterfalls with a miniature lake at the base. The "Paradise" with its surrounding forest, its



FEEDING TIME

campfire, and its comfortable davenports was well patronized during the entire evening.

Chet Jackson and his bartenders engineered the barroom, its fixtures and the manner in which drinks were served in a fitting manner for such a reminder of the "Old West."

Stanley Lukens installed the high lead logging outfit. It was operated from the balcony and used to run out dance numbers, announcements of eats, and other scheduled events. So much for the decoration of the gymnasium itself. As can be seen in the accompanying pictures, the costumes worn fully reflected the spirit of the West. Intensive advertising by the management that only Western costumes would be in vogue had the desired effect. We "old-timers" of the Forest School want the Ball to be a Western costume ball and not a general parade of bizarre costumes.

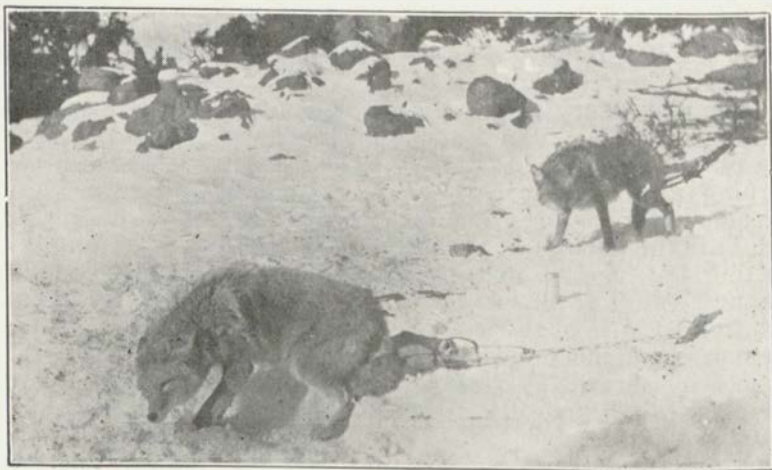
Complimentary mention is made of the business like manner in which Tom Van Meter handled the hiring and costuming of the orchestra; of Harold Russell and Jack Baggs in designing and contracting for the programs and tickets; of "Scotty" Merryfield in handling the finances; of Gordon Cornell in taking charge of the next to the meanest detail of all,—getting the boughs, and of Alban Roemer, who handled the meanest detail of all,—"eats." The latter detail needs special mention because of the lack of waste in food materials and the manner in which a crowd of approximately 400 couples was satisfactorily served. "Tommy" Thompson and his cartoons of the class of '26 and of the Forest School faculty comes in for his share of the applause. To his fertile imagination we owe the thirty-inch boot tracks of Paul Bunyan heading for the Forester's Ball. Due mention is made of those members of the Freshman, Sophomore and Ranger classes who did their bit to make the Ball the success it was. The management called Dean Spaulding's attention to those, not committee men, who were not afraid to work. "Lanky" Spaulding, assistant general chairman, merits special mention for the way he looked after the thousand and one little details. Sam Harris,

general chairman of the two previous balls, gave invaluable assistance as advisor to the general chairman.

The spirit of the "Old West" is not far behind us in the calendar of time. Then men needed no other credentials than a pair of stag pants or overalls and a flannel shirt—in the words of Sam Harris: "These and the conduct of a gentleman would insure him a perfect evening's entertainment in any dance hall of our free and easy-going State, even though he was a stranger to everyone."

We Foresters may well boast of the popularity of our annual Ball. We all know it has gained its popularity, not because it typifies Forestry particularly, but because the spirit of the "Old West," good will and hospitality, is the dominant keynote.

LET'S MAKE THE THIRTEENTH ANNUAL FORESTER'S BALL THE BIGGEST AND BEST YET!



EXTERMINATING THE COYOTE

SILVICULTURE ODDITIES

Olive Leaf is a clerk way up here in the Deerlodge.

J. F. Rice and M. L. Marsh of the Selway ought to get along well for it takes a marsh to grow rice.

Service Brevities

We wonder if Frisco Rogers of the Apache Fears to Swapp Marks with McCamant because of the Suite Blooms on the Tuleroso?

If the Tonto were to hire a temporary clerk the assistant super could sure "Sizer" up.

O. C. Painter ought to be a ranger on the Taos district of the Carson.

Is the super of the Powell ever a "Riddle" to his subs?

D-5 has a "Fair" at all its exhibits.

A Remedy for Arid Regions

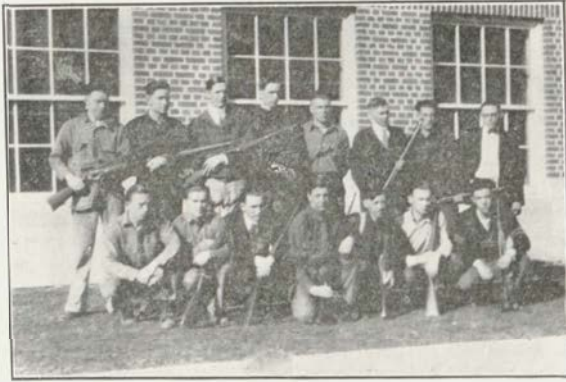
Dr. Jesse: Hydrofluoric acid poured on sand will give water and a gas.

Thompson: Then if you poured a barrel of hydrofluoric acid from an aeroplane onto a desert you would have a lake.

SEE IF YOU CAN FIGURE THIS OUT

Helena Challis ate a Bitterroot Custer pie out of Jefferson's Cabinet and then after drinking some Clearwater from the Kootenai turned her Blackfeet into the Deerlodge of St. Joe the Flathead. He made a Medicine Bow with a Beartooth over a Beaverhead skull. Helena got over her Malheur right Tonto so old St. Joe demanded that she Routt up the Montezuma from the Bighorn for he was no Piker. But Lewis and Clark had seen the Apache Crook, Prescott, hi-tailing for Eldorado, California to a Cache for he was a Weiser man and could Sierra the day broke that he must cross the Natural Bridge in Dixie to escape from the Umatilla sheriff. To dodge the Cherokee Luquillo he shipped on the Shenandoah. When the old ship burned from being hit by a Humboldt Prescott looked Ashley, Sawtooth and Kaibab Caribou and if he had not Cascaded with the Salmon into Fishlake would be inyou Angeles with a Shasta daisy in one hand and a Holy Cross in the other singing in a Mono-tone to the Trinity with the accompaniment of Whitman's Columbia orchestra.

Beall.



THE RIFLE TEAM

THE FOREST SCHOOL RIFLE CLUB

In the year of our Lord 1921 a group of Forest School six gun and rifle cranks conceived a brilliant idea, "Why not form a rifle club whose membership would be limited to students of the Forest School, then affiliate with the National Rifle Association and receive rifles, ammunition, and range accessories free? Plenty of shooting without heavy cost?" That year their membership rolled up to thirty.

Since then most of the founders have passed through the doors of the "Old Shack" into the world of affairs but there remains the same spirit of co-operative organization that keeps many a budding champion popping away.

At the first meeting of the Forest Club last Fall, President Beall gave an enthusiastic spiel entitled, "Shoot All Year for Just a Dollar." The hot air netted sixteen dollars that night and more kept coming in as the young hopefuls became ambitious, finally totaling a membership of forty-seven after the rangers had been wheedled from their dollars.

Practice commenced immediately. Every Sunday afternoon at two o'clock the clan would gather at the R. O. T. C. gallery. At first the practice consisted of sighting and position exercises. Then the tyros were allowed to see how often they could miss the bull. Plenty of it had been spread but results showed that few were hit. Perhaps in no other sport is the old slogan, "Practice makes perfect," any more true. As practice proceeded, improvement was rapid.

At the beginning of the Winter quarter after, the "Short-horns" joined us, a program of matches with other clubs was fired. We were beaten most of the time, but as every good

shooter has one, we also had an alibi, "Guns no good." Next year we expect to have better ones.

For a long time we blatantly challenged the Co-ed Team to a joint match. Finally, to silence us they accepted, and boys, the joke was nearly on us. They beat us 442-443 even though we did get the 443. After the shoot the foresters served a feed.

We were rather disappointed with the R. O. T. C. match, for although we trimmed them 3292-3103 they were unable to come over and shoot on our day thereby depriving us of the pleasure of a joint match. This is an established annual match which in the future will bring out more enthusiasm, for Major Geo. L. Smith, commandant of the R. O. T. C., has established the Bradley Trophy which will be awarded annually to the winning team. This trophy was named in honor of the first soldier to be killed in the Battle of the Big Horn.

The rangers performed a dehorning operation on the "long horns" in defeating them by three points. The shooting was poor on both sides. The rangers produced a full ten man team but the regulars had only five members turn out. It is hoped that next year better spirit will be shown for the match. At the finish the regulars thought that they had won by three points but when the "shorthorns" got through juggling the score they came out three points in the lead, thereby gaining ten points for the dual meet. The regulars still maintain that the "shorthorns" aren't better shots, just better pencil pushers, and now plan to take some courses in higher mathematics so as to turn the tables next year.

The spring ushered in the outdoor season. We commenced with carpenter work, for we had to build a target frame out of Mt. Sentinel. Here shooting with the 30-06 Springfield commenced at 100 and 200 yards. The range is better adapted to pistol and small bore shooting. When the road up Pattee Canyon is in shape we will go up to the Fort Missoula Range with the light artillery (30-06) and fire the regular army "A" course up to 600 yards, for we hope to put a team in the Third Annual Northwest Tournament to be held on that range May 15-16.

One of the triumphs of the Club was reflected in a national match in which Beall took part. He won the National Prone Tyro Championship with a score of 399 out of a possible 400.

A word of appreciation is due the R. O. T. C. whose helpful co-operation has made it possible for us to flourish.



THE MONTANA DRUIDS

By John B. Thompson

The Montana Druids is an honorary organization composed of Faculty members and upperclassmen of the Forestry School, Alumni who are graduates of the Montana School of Forestry, and a very limited number of Honorary members who are closely connected with the Forestry School and who are actively interested in Forestry.

The active members are chosen from those of better than average scholastic standing who are active members of the Forestry Club. They must also have shown special interest in the upbuilding, support, and maintenance of the standards of the University in general and of the Forestry School in particular. They must have the interest of Forestry at heart; which means the furthering of Forestry for the sake of the Forests.

Meetings are held at the School of Forestry, or weather permitting, in the Forest.

The purposes of the society are: to furnish a more direct connecting link between the School and its Alumni; to bring closer contact and unity of effort between upperclassmen and the Faculty; to support, aid and uphold every endeavor of the Forestry Club; to further the practice of Forestry to the benefit of the forests whether on private, National, or State lands, and to create a feeling of loyalty and reverence for the Forests and the profession of Forestry.

Our pride consists in the accomplishments of our Alumni. Our greatest asset is the counsel and advice of our Honorary members.

Our greatest resource is the able body of beginners in the School of Forestry who will some day make this society that which we hope it to be.



OUR MOTTO:

To give full measure of service.

He was a rootin' tootin' forestier
Who came from out the sticks.
He said, "I'm goin' to go to college
For to 'similate some knowledge
As I surely must acknowledge
That I'm not quite up to tricks."

He took a bit of everything,
He dabbled in it all,
And although he went to college
He still hasn't any knowledge
And he surely must acknowledge
That he "Didn't hit the ball."

Alban Roemer.

THE DUAL MEET

By Al. Roemer

Every year during the Winter quarter a meet is held between the shortcourse students and the regulars of the Forest School. Competition is keen and excitement reaches a high pitch during the meet. This year the shortcourse men won by a score of 41-33. By winning the rifle match the previous Sunday the shorthorns started the night with a ten point lead. Twelve events with a total score of 74 points were completed.

Cornell and Spencer of the regulars won first and second places in the rope climbing contest and gave the regulars their first eight points. Coleman, shorthorn, took third place, giving the shorthorns another point.

"Slim" Wagner, short course man pulled a high lead stunt on the longhorns in the tug-of-war. As lead man on the rope he made it impossible for the regulars to get a straight pull by keeping the rope on his shoulder.

By winning the first two wrestling contests the regulars crept into the lead. Cornell who conceded twenty pounds to Johnson, won the catch-as-catch-can wrestling match with a straight arm hold and a side roll in three minutes and thirty-five seconds. Nelson won two straight falls in leg wrestling from Rasmussen. The shorthorns again took the lead when Julander won the hand wrestling contest.

Crocker and Kerr, shorthorns, showed the longhorns up in the packing contest by packing their horse decker style in two minutes, twenty-nine seconds. Besides speed, the judges based their decisions on neatness and security of the packs.

By coming in three yards ahead of their opponents, Coleman and McCullough won the three-legged race for the shorthorns.

Kerr and Harris competed in the roping contest. Each made one heave. Harris missed but Kerr roped his "calf" by the front foot. Beall and Reed gave a fencing exhibition between the roping and tilting contests. Emerson won the tilt for the regulars with one poke.

Ernst, Nelson, Ellis, and Brenner won the back-packing relay race from the shorthorns by a fair margin. Robinson, Julander, Bolander, and Carter raced for the short course men.

Wagner, of tug-of-war fame, showed superior axemanship in the chopping contest by chopping through an eighteen-inch tamarack log in four minutes fifty-three and one-fifth seconds. Vierhus chopped for the regulars.

The sawing contest was won for the regulars by Egge and Fox against Root and Rasmussen of the shorthorns. The

same log that was used in the chopping contest was used in the sawing contest. The winners burned through in twenty-one and one-fifth seconds. H. A. Searles of Portland presented the winning team with a "Silver Steel" crosscut saw donated by the Atkins Saw Company.

Al Roemer and his gang threw out the grub to the crowd in the Forestry Building after the meet.

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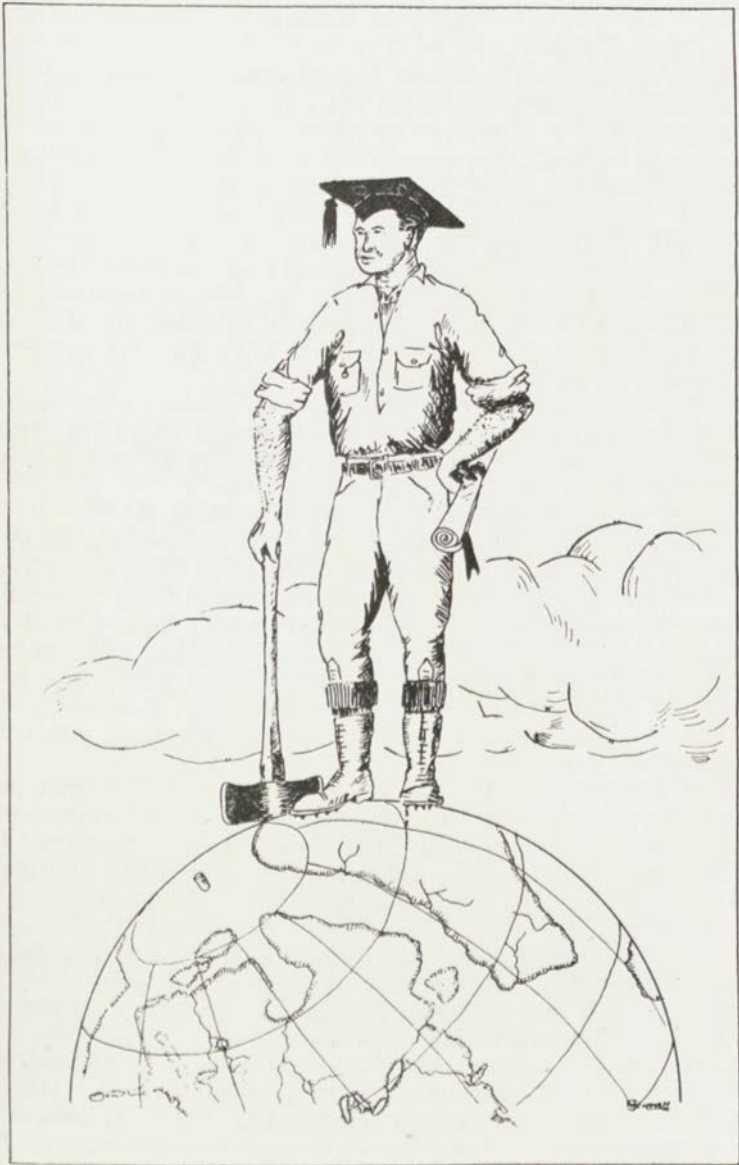


ICEBERG LAKE

CLASS

OF

1926



CLASS OF 1926

By Alban Roemer

After four years or more eleven men are emerging from the battle of grade points with their B. S. degrees in forestry. In spite of the popular notion of "college boys," these men who are graduated this spring did not "Rah-rah" their ways through school. They worked, and worked hard for their degrees. However, in all things there must be a balance between the serious and the not-so-serious. Without an exception, the class of '26 stood ready to aid and co-operate in extra-curricular activities as the need arose. It is expected that every member of the class will continue to show the same fine spirit in their chosen profession that they have shown while at school.

Jack Baggs made the Frosh football squad in '20, became a Bear Paw in '21, is a member of Phi Delta Theta fraternity, the Forestry Club, secretary of the Montana Druids 4-5, and a member of the Inter-fraternity Council 5.

Carl F. (Step-and-a-half) Beall entered U. of M. as a Junior from the Ohio State University. He was a member of the Grizzly Band 3-4-5, captain of the R. O. T. C. Rifle Team 3-4, received the Duniway Scholarship in Military Science 4, member of the Forestry Club 3-4-5-6, Forestry Rifle Club 3-4-5, president of the Rifle Club 6, charter member of Scabbard and Blade, Montana Druids, Phi Sigma, and a gun crank from the top of his head to the bottom of his feet. Besides "Step" teaches the fine arts of fencing for the physical education department.

Ray Bowers is a D. A. V., a member of Phi Sigma, was assistant editor of the Forestry Kaimin 4, Junior representative on the executive board of the Forestry Club, managed the 1926 Foresters' Ball, vice-president of the Montana Druids 4, and was a member of the Forestry School Rifle Club.

"Colonel" Canfield was editor of the 1925 Forestry Kaimin, vice-president of Phi Sigma 4, president of Phi Sigma 5, president of the Forestry Club 5, and Druid Mentor 5. He is an active member of the A. B. T. A., and took an active part in all major Spanish athletic events.

Charles Joy entered the Forestry School in '18 and left in '22 to take a job as ranger on the Madison Forest. He finished his school work by correspondence. While at school he was president of the Forestry Club, and is a member of Phi Sigma Kappa.

Stanley Lukens finished his school work during the Winter quarter of '26. He is a member of the Forestry Club, the Montana Druids and Phi Sigma. At present he is holding a ranger job on the Missoula Forest.

"Merry" Merryfield is a D. A. V., was a member of the Forestry School Rifle Club 1-2-3, treasurer of the Forestry Club 3, vice-president of Kappa Tau 5, and treasurer of the Montana Druids 5, and student assistant in surveying. Grade points are nothing in his young life, he has plenty of them.

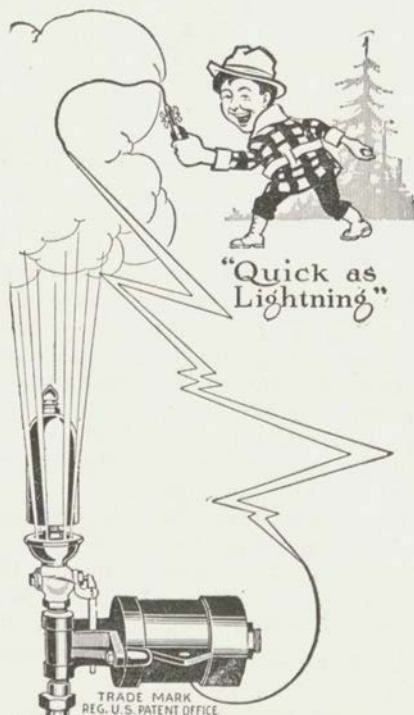
Hal Russel is a member of Sigma Phi Epsilon, Senior representative on the executive board of the Forestry Club, a Montana Druid, and a member of the Press Club. Jack Baggs says Hal is a wonderful girl.

John B. Thompson: Nationality, Irish. He says, "Aye bane har five yar. If dey don't fence the campus aye might get back." Member of the Forestry School Rifle Club, position—gun cleaner, Phi Sigma, position—politician, Forestry Club, position—treasurer 5, Montana Druids, position—president, married, position—second in command,—infantry, student assistant in mapping 4-5.

Earl Tennant finished his work at school this Winter and is now ranger on the Lo Lo Forest. He is a member of the Forestry Club and the Montana Druids.

Tom Van Meter transferred from the University of Illinois as a Junior. Before attending the U. of I., he spent one year at the Southeast Missouri Teachers' College. He is a member of Phi Delta Theta, the Forestry Club, the Montana Druids, and the Interscholastic Committee of 25-6. The honor roll will not look right next year without Van's name.





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PLEASE MENTION THE FORESTRY KAIMIN

SLASH DISPOSAL IN THE INLAND EMPIRE

(Continued from Page 46)

Determination of Costs

The expenditure justified for disposal cannot be arbitrarily fixed, because of varying factors found in every stand and type, a middle aged stand is considered cheapest on account of the shading of the ground and consequent absence of reproduction and understory. Such a stand has small crowns and the ground is usually free from brush. In an old stand, the crown foliage is dense and heavy, an understory is nearly always present and due to openings in the forest canopy brush and reproduction are present in varying degrees.

The Forest Service usually considers the cost of disposal "limited by the amount needed to broadcast burn and plant the area," or the amount needed for disposal must not exceed the difference between the cost of suppression plus the amount of damage from fire on a tract on which the slash has been disposed of and a tract of equal fire hazard on which slash has not been disposed of. The first method, broadcast burning has failed as a fire preventive, in some cases even increasing the hazard by killing unmerchantable trees which when dry are windthrown completely cover the ground with an inflammable thicket. To render such an area safe from re-burn, all unmerchantable trees must be felled and this cost added to the total costs which are set forth in the following table taken from Department Circular 292 by J. A. Larsen and W. C. Lowdermilk, entitled *Slash Disposal, in Western White Pine Stands in Idaho*.

(Continued on Page 83)

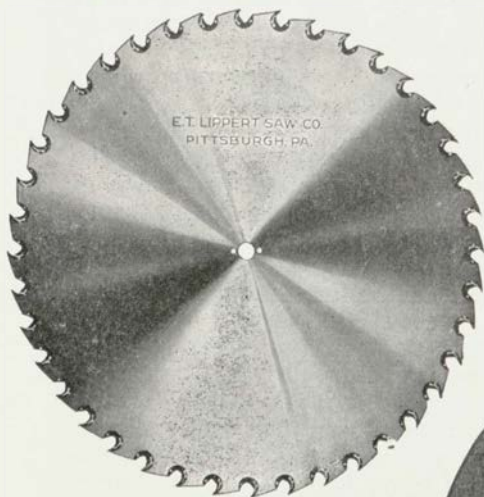


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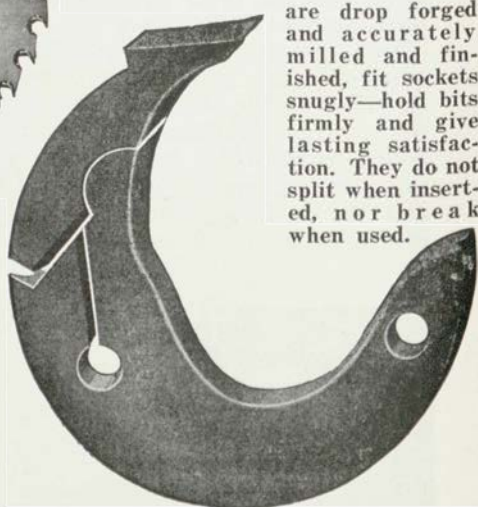


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First Method

	Per Acre
Felling unmerchantable trees.....	\$4.00 to \$10.00
Burning without fire line.....	.50 to 2.00
Planting	8.00 to 12.00
Range.....	\$12.50 to \$24.50

If these figures are applied to an average stand of 25,000 board feet per acre, the costs of disposal will range from \$.50 to \$1.00 per thousand board feet.

Second Method

In this method the difference between the cost of fire on areas on which slash had been disposed of and on areas on which slash had not been disposed of was calculated for 334 fires on the Coeur d'Alene and Kaniksu National Forests for the period 1916 to 1920. The results are set forth in the following table:

No. of Fires	Average per Fire		
	Area in Acres	Cost of Suppress'n	Damage and Loss
Within cutover areas, 93 fires....			
Slash disposed of 45 fires.....	5.27	\$ 63.09	\$ 1.34
Slash not disposed of 48 fires....	116.64	1220.50	667.16
Outside cutover areas 241 fires..	12.05	98.56	51.60

The total of fires on cutover areas was 93. If the average area suppression costs and losses; first on the areas on which slash had been disposed of and then on the areas on which slash had not been disposed of, are multiplied through by 93 the following results will be obtained:

Costs and damages on areas where slash was and was not disposed of. Total of above averages times 93.

	Slash disposed of	Slash not disposed of
Total area burned over, acres....	490	10,848
Total suppression costs.....	\$5,867	\$113,506
Total damage losses.....	125	62,976
Total Cost and Loss.....	\$5,992	\$176,482

From this table it is learned that if no slash had been disposed of on any of the area in the 5 year period covered, the total cost and loss would have been \$176,482 if the 93 fires had occurred as they did and the averages for fires on undisposed areas would have held for the 93 fires as they did for the 48.

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board feet for the 5 year period the cost and loss chargeable to each thousand board feet would be \$1.17 if this measure eliminated all fires. If, on the other hand, all the slash had been disposed of, the loss would have been \$5,992 or 4c per thousand board feet.

The effectiveness in reduction of the fire hazard of slash disposal noted above is that which is generally attained by this measure. This 4c is an inevitable cost, that which occurs even on lands on which slash has been disposed of, so this must be subtracted then from the \$1.17 leaving \$1.13 as an indicator of the justified expenditure.

Good argument for cost of slash if not disposed compared with cost of slash disposal.

Justification of other grounds for protection are difficult to determine. Immature trees, advanced growth and reserved trees, all have a value. When loss of these are added, a further justification of disposal results.

Methods

Slash has been disposed of by broadcast burning, piling and burning and forest burning, which will be taken in order.

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Lopping and scattering is not disposal and will not be discussed.

1. Broadcast burning on the National Forests, has been restricted to lands listed for homestead entry. The method has not been even partially successful in reducing fire hazard and has failed from a silvicultural standpoint. In most cases it has even increased the fire hazard and has at the same time destroyed great amounts of reproduction and immature timber. Its failure is so pronounced that it has been discontinued on national forest land.

2. Piling and burning in two separate operations is the standard practice for District One. In this method all chunks up to four inches thick are piled and later burned when conditions are favorable. This matter is laid in one direction in piles up to 40 feet in circumference and averaging 40 to 60 piles per acre. The weight of winter snow forces these piles into compact masses, which are easily burned. The primary consideration is to make the piles so they will burn at a time of the year when the woods are damp. Inexperienced men are apt to place the piles against reserved trees or windfalls, causing needless expense in repiling or damage to seedlings. It is advisable to pile slash as soon after logging as possible as it

(Continued on Page 87)

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has been found to be 25 to 30 percent cheaper to pile when green and more agreeable to handle by the pilers. It also has a waxy coating at this time and this greatly helps the burning by keeping the material dry so it can be burned in damp weather. Prompt piling also reduces the fire hazard and is greatly desirable from this standpoint.

Burning the piles is a difficult and dangerous undertaking and should be entrusted only to experienced men. A knowledge of wind currents and the habits of fire in the woods is needed. On slopes the soil on the upper side of piles is dried out and favors the spread of fire up the slope with a resultant uphill draft which is very dangerous at certain hours of the day. The difference in inflammability of the forest covering is wide between the hours of 8 a.m. and 3 p.m. and if danger exists only alternate piles should be fired, or burning stopped at once. In every case burning should start at the top of the hill.

Piling and burning has proved its utility in reduced fire hazard, it saves young growth, preserves 70 percent of the forest duff, and retains most of the evergreen vegetation. Its advantages outweigh the difference in costs in all ways.

3. Forced burning can be applied at somewhat lower costs than piling and burning but must be limited to favorable

(Continued on Page 89)

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weather and individual operations and therefore has not come into general use.

Summary

The quantity of slash resulting from logging operations in Idaho with the long dry summers combine to make slash disposal a necessary operation, at the same time expensive, absorbing about 30 percent of the proceeds of sales. An examination of costs show this to be around \$1.00 per thousand board feet which is amply justified by reduced fire hazard.

Two methods have had extensive trial, broadcast burning, and piling and burning.

Broadcast burning is an utter failure as a fire preventive unless all unmerchantable trees are felled. By this method practically the entire area is burned over, destroying all hope of satisfactory restocking by the desired species. This method permits the invasion of a dense cover of fireweed, thistles and sedges which compete with the seedlings for soil fertility and moisture, leaving the ground in such condition that on poor sites only the hardiest seedlings survive.

In the dry months this vegetation becomes dry and once ignited fire will run through it much as a grass fire on the prairie making control difficult or impossible. With the increased air temperature prevailing on these areas and the wind currents resulting the conditions for seedling survival and the spread of fire are rendered critical.

The abundant reproduction following burns in virgin timber is often cited as an argument for broadcast burning, but seeding in on burns in green timber cannot be compared with that which follows fires on logged-areas. A portion of the seed in the cones is immature at the time of a fire in virgin timber which is preserved in the cones and sown in the ashes where it finds conditions ideal for survival.

On logged land the seed trees are removed and the logging debris creates a fire so hot that the ground is completely roasted making the chance of seed survival remote. There is no assurance that as good a stand of reproduction will result on a broadcast burned area as on a green timber burn.

Spokane, Washington, November 27, 1925.

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Don't mind the feller thet's bellerin' (about whut he's going to do.) He genelly ain't done nuthin' an' is going to keep right on doin' the same.

Don't let nobody ride over you, but by the same token, don't try to ride over nobody else.

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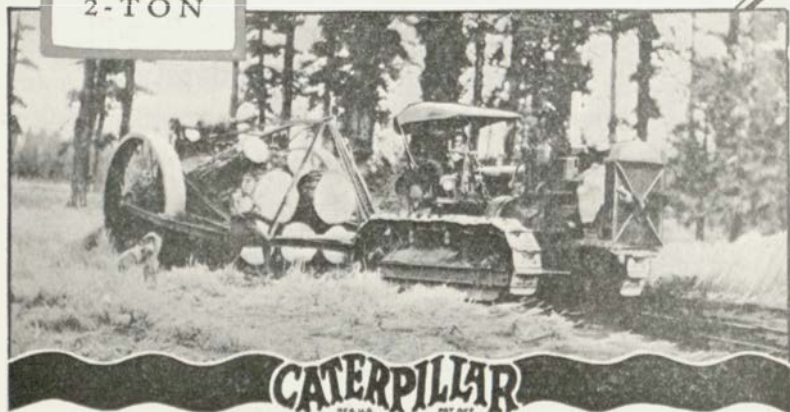
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County Surveyor, Superior, Mont.
 Cramer, John A., B. S. Forestry.....
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Forest Assistant, U. S. F. S., Missoula, Mont.
 Myers, R. E., B. S. Forestry.....
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SUMMER WORK—1925

Barkes Adams—Trail survey on Cabinet and fire crew foreman.

Homer Anderson—Cruiser, U. S. F. S., Selway.

He reports on eventful summer, with wonderful fishing, plenty of wild game, fine timber, a scenic country and an absence of the fair sex.

Jack Baggs—Rode ditch in the Bitter Root Valley.

Force Baney—Assistant Ranger at Rexford on the Kootenai.

George Barnhart—B. Plant Industry—Blister Rust. Reconnaissance near Priest Lake

Carl Beall—Fogging wild horses on the Beaverhead and doing improvement work.

Charles Bloom—Scaler on Martin Creek timber sale on the Cabinet Forest.

Les Burbank—Trail work on the St. Joe in Northern Idaho.

Steve Carlson—Guard on the Lolo at Quartz Station.

Gordon Cornell—With party of Northern Pacific timber cruisers.

Joe Darlington—The only woman in the Forest School in years held down an adventurous position as lookout on the St. Joe under "Judge" Girard.

Kenneth Davis—Headquarters smoke chaser at St. Regis on the Lolo.

Nelson Fritz—Public Relations work at Camel's Hump and patrolman on the Lolo Forest.

Sam Harris—Foreman of telephone construction and improvement crew on the Lewis and Clark Forest.

Louie Bossart—St. Joe, planting.

Ray Bowers—Grazing reconnaissance on Custer.

Russell Coburn—Lookout on Lolo forest.

Ed. Dunstan—U. S. F. S. Topographic surveying.

Charles Kumler—U. S. F. S. Cruiser on Selway.

L. H. Colby—Chief of party of cruisers on Selway forest.

Roy Canfield—Grazing reconnaissance on Custer.

Reid Harmon—U. S. F. S. engineering party.

Stanley Lukens—Haugan Nursery. Head nurse to several hundred thousand pine seedlings, to be planted on some of the 1910 burns on the Coeur d'Alene.

LeRoy Merryfield—State fire warden at Clearwater.

Harold Russell—Summer school. "Hal" was among a surplus supply of "Co-eds" while most of the men were in the bush for three months without seeing a woman.

Claude Samples—Lookout, Lolo Peak, Lolo forest.

Howard Hawk—U. S. F. S. Cruiser Swan Lake country.

Chester Jackson—Lookout, smoke chaser and improvement work on west end of the Lolo district.

Briggs Lund—Custer Forest—Field Assistant. Grazing reconnaissance.

Lawrence McDonald—Foreman Blister Rust eradication. Priest Lake.

Buck Merrill—N. P. Cruiser under Pete Ronan.

Arthur Mikalson—Logging camp foreman, Libby.

Mattison Spencer—Patrolman, Lookout for the state.

Al. Roemer—Cabinet on fire suppression.

J. B. Thompson—Assistant Ranger Pend 'Oreille national forest.

K. Sanders—Lookout, Nez Perce.

Donald Shaw—Boise, District 4, Cruiser under Junior Forester Felix Koziel '24.

Tom Van Meter—Northern Rocky Mt. experiment station.

George Wright—Smoke chaser on Bitter Root.

Harry Van Winkle—Boise forest, with Shaw and Koziel.

Earl Tennant—Lolo Hot Springs as Assistant Ranger. He is now ranger at the Springs.

Ed Tennant—Had a tie contract in Wyoming for the Southern Pacific. The ties were driven 300 miles down the Green River.

Carter Rubottom—Patrolman for the Blackfoot Forest Protective Association.

Louis Vierhus—Patrolman Blackfoot Forest Protective Association.

Clarence Spaulding—Patrolman and foreman fire crew for the Blackfoot Forest Protective Association. He reports a busy season with 45 fires, 3 class C, on a total of 100,000 acres.

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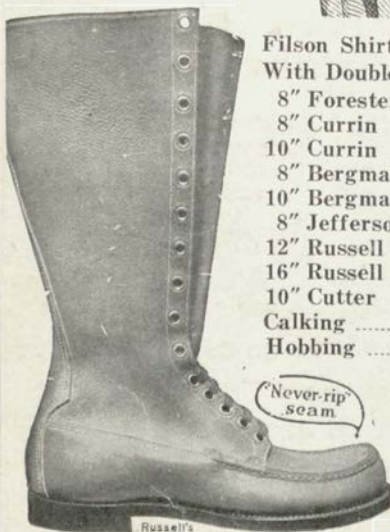
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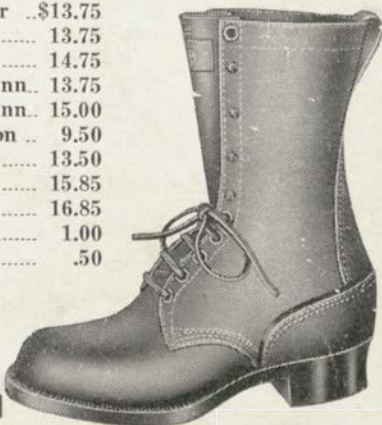


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