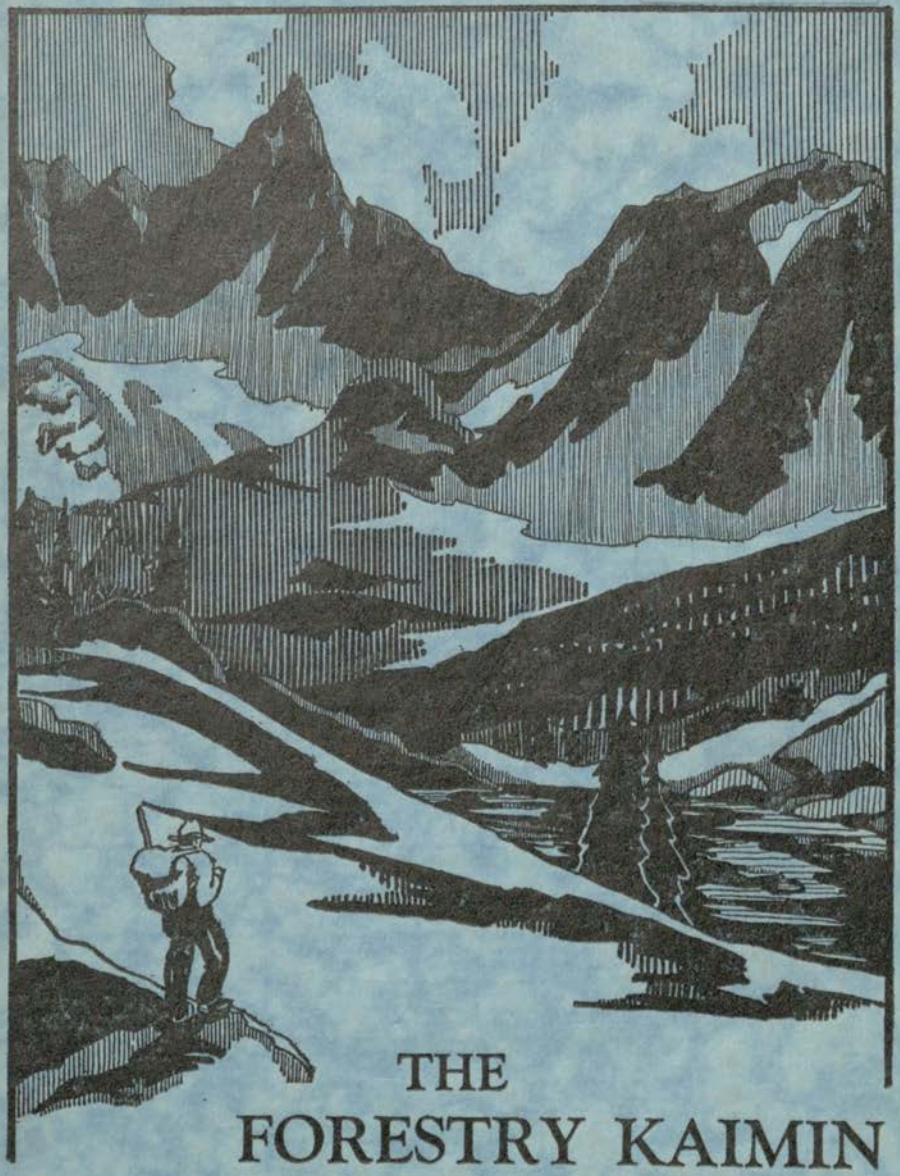

THE FORESTRY KAIMIN

1915-1929

MONTANA STATE UNIVERSITY

THE FORESTRY KAIMIN

1929

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K. D. Flock.....Editor Joe Kische.....Asst. Bus. Mgr.
B. C. Park.....Bus. Mgr. Fred Staat.....Asst. Editor
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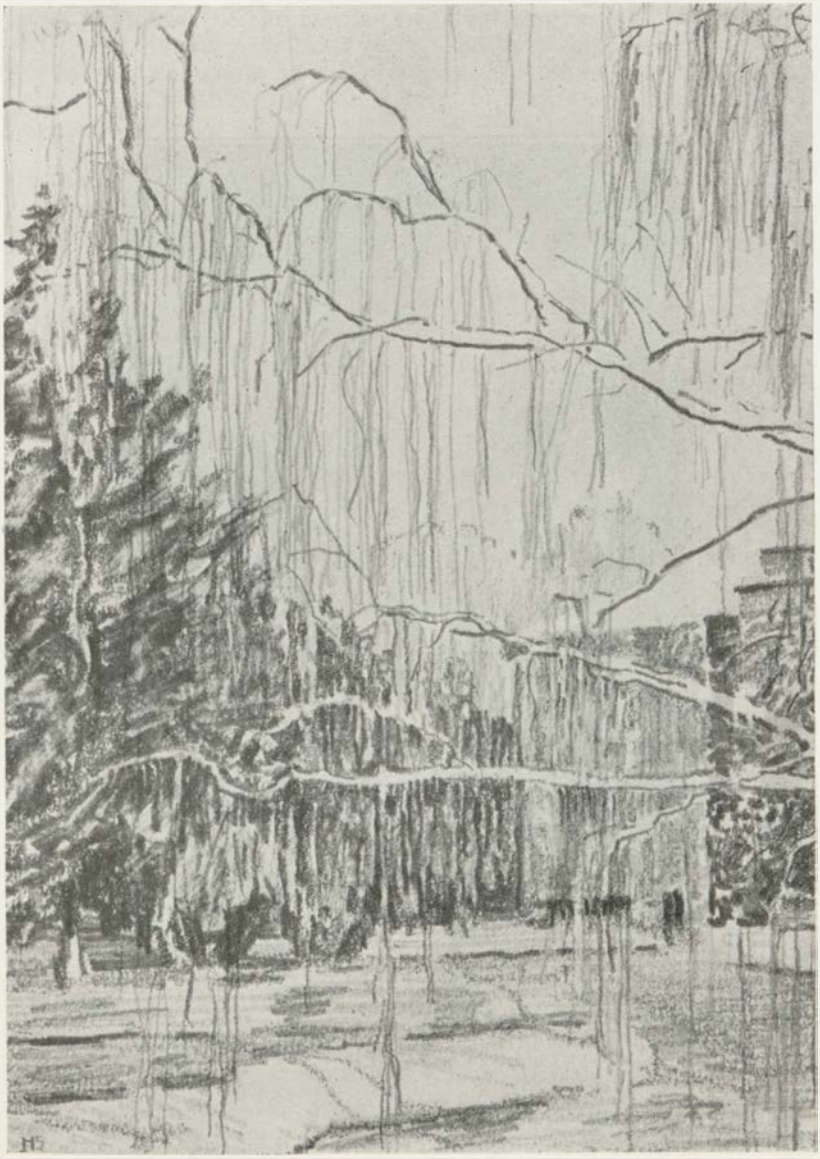


DR. JOSEPH E. KIRKWOOD

To the late Dr. Kirkwood of the Montana State University, a true forester and man of inspiring ideals do we, the members of the Forest Club, respectfully dedicate this volume.

DR. KIRKWOOD OUR FRIEND

The death of Joseph E. Kirkwood, chairman of the Department of Botany of the Montana State University on August 15, 1928, was a sudden shock to those who knew him and his works. He had been working at the Biological Station on Flathead Lake, and was just preparing for a trip to California to spend his sabbatical leave of absence when death's untimely summons came.

Dr. Kirkwood came to Montana as assistant professor of Botany and Forestry in 1909 under Dr. Elrod in the Department of Biology. The next year, the Department of Botany was established as separate from the Department of Biology and Dr. Kirkwood was made chairman of the new department, and professor of Botany and Forestry. He was at least in part responsible for the giving of instructional work in Forestry subjects until 1914, when the Forestry School was organized and his title was changed to Professor of Botany, instead of Botany and Forestry.

All of Dr. Kirkwood's published works number some twenty odd and many are of special interest to foresters. In 1918 the Bureau of Education published his "The Conifers of the Northern Rockies." In 1922 "Forest Distribution in the Northern Rockies" was printed. The Northwest Science carried his paper in 1928 entitled "Some Forest Seeding Experiments in the Rocky Mountains."

His "Trees and Shrubs of the Northern Rockies" was still in manuscript form at the time of his death, it had been for some time, but had not been published because its illustrations made the cost of publication greater than probable income from the sale of the book. However, a contract has been signed between the University of Montana and the Stanford Press which will bring about the publication of this manuscript, probably in the early autumn of the current year. This manuscript will make a book of some 500 pages and since Dr. Kirkwood had seen practically every species treated in the book in the field, it will add much to our literature on the trees and shrubs of the Northern Rockies.

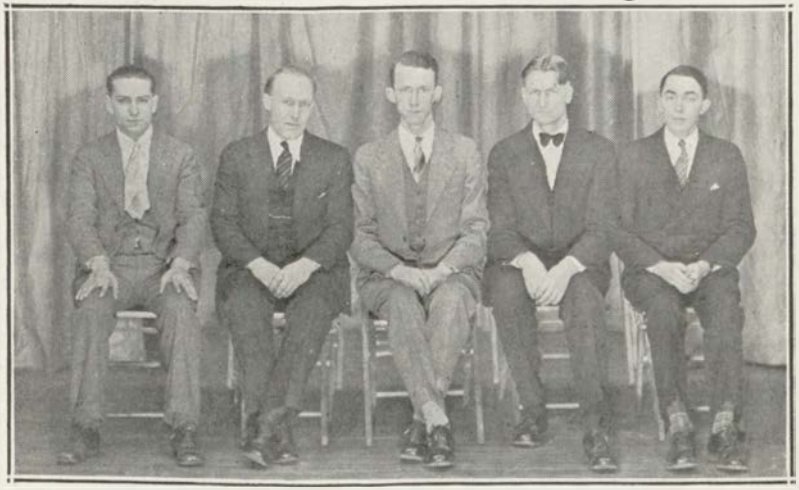
Dr. Kirkwood was an untiring worker in the field and through his efforts the Montana State University herbarium will receive at least 10,000 accessions. Part of these, of course, will be acquired through exchange with other collectors but credit for the original effort is entirely due to Dr. Kirkwood.

That his teaching was successful is substantiated by the fact that a good share of the men whom he helped to train have been strong in their professional work.

His students said he was strict but never did they say he was unfair or disinterested in the fellow who was earnest and faithful in his work.

Note: Most of the information in this article was kindly furnished by Professor J. W. Severy of the Botany Department of the State University of Montana.

THE STAFF



Joe C. Kische K. D. Flock Barry C. Park
Floyd Phillips Fred E. Staat

SOME HIGHLIGHTS IN RANGE LIVESTOCK BUSINESS OF MONTANA: PAST AND PRESENT TRENDS

By Glenn A. Smith, Assistant District Forester, in charge of the Branch of Range Management, District No. 1, U. S. Forest Service.

The history of the range livestock industry of Montana, if fully recorded, would fill several large volumes. Space here will only permit of very scanty treatment of the subject. I hope that someone will, before it is too late, take up this romantic, interesting and very important task.

Since the foundation of the range livestock industry of the West, and most especially Montana, is "grass", it seems fitting to preface this sketch of the range livestock industry by quoting that inspiring, as well as charming, tribute to grass written by one who knew the West the best, the late John J. Ingalls, United States Senator from Kansas, the land of grass.

"Grass"

"Next in importance to the divine profusion of water, light, and air, those three physical facts which render existence possible, may be reckoned the universal beneficence of grass. Lying in the sunshine among the buttercups and dandelions of May, scarcely higher in intelligence than those minute tenants of that mimic wilderness, our earliest recollections are of grass, and when the fitful fever is ended, and the foolish wrangle of the market and the forum is closed, grass heals over the scar which our descent into the bosom of the earth has made, and the carpet of the infant becomes the blanket of the dead.

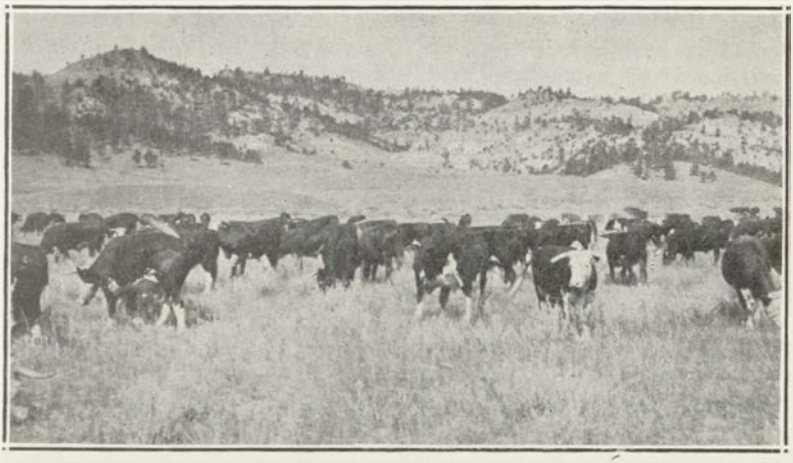
"Grass is the forgiveness of nature—her constant benediction. Fields trampled with battle, saturated with blood, torn with the ruts of cannon, grow green again with grass, and carnage is forgotten. Streets abandoned by traffic become grass grown, like rural lanes, and are obliterated. Forests decay, harvests perish, flowers vanish, but grass is immortal. Beleaguered by the sullen hosts of winter it withdraws into the impregnable fortress of its subterranean vitality and emerges upon the solicitation of spring. Sown by winds, by wondering birds, propagated by the subtle horticulture of the elements which are its ministers and servants, it softens the rude outlines of the world. It invades the solitude of deserts, climbs the inaccessible slopes and pinnacles of mountains, and modifies the history, character, and destiny of nations. Unobtrusive and patient, it has immortal vigor and aggression. Banished from the thoroughfares and fields, it bides its time to return, and when the vigilance is relaxed or the dynasty has perished it silently resumes the throne from which it has been expelled but which it never abdicates. It bears no blazonry of bloom to charm the senses with fragrance or splendor, but its homely hue is more enchanting than the lily or the rose. It yields no fruit in earth or air, yet should its harvest fail for a single year famine would depopulate the world."

Stock and Range Lands

Montana is and always will be an important range state, since approximately 75% of its area is essentially range lands. Those who came to Montana in the 80's have vivid recollection of the unlimited and unsurpassed open range. The hills and valleys were covered with luscious stands of high quality grasses and it was in those days that the cattle and sheep outfits operated from a headquarters ranch where little or no crops were harvested, but used the open, free range to run their herds year-long. In those days range forage cost little or nothing, and the investment in ranch and breeding stock was low. Fixed carrying charges, such as interest, depreciation, taxes and labor on a large cow or sheep outfit were very low.

According to best historical data available, the first beef herd was established in Montana by John Grant in 1853. Between that date and the completion of the Northern Pacific Railway in 1883, there was a steadily growing number of herds trailed in from Ogden, Salt Lake, Cheyenne, and some from as far south as Texas. In 1885 there were 79,089 cattle shipped to market from Montana. In 1891, six years later, 250,000 cattle were shipped to market from the state. The average from that year until 1912, with the exception of 1900 and 1901, exceeded 200,000 head per year. During this period most all of the stock were handled on a practically year-long range basis.

The first sheep assessed for taxation purposes were 1769 head in the year 1865. In 1880 the records show 249,978 head in the state; in 1890, 1,990,000 head; in 1900, 6,170,000 head. The peak in numbers was attained in 1901 when 6,417,000 head of sheep were listed and the high wool clip was in 1904 when it amounted to 37,773,000 pounds. In the first decade of this century settlement by homesteaders began to be seriously felt by the livestock industry in Montana. Some of the larger owners of livestock gave up the business entirely, some acquired large land holdings and some moved to hay ranches adjacent to the National Forests. From the period 1910 and 1915 many large ranch holdings were divided up and sold. By 1923 the number of sheep in Montana had decreased to 2,315,000, or not much more than a third of the maximum in 1901. The total number of cattle in the state has not materially decreased. There was a peak of 1,510,000 in 1898 and another peak of 1,610,000 in 1919. In 1923 there were 1,400,000 cattle of all descriptions. While the same factors, that is, the settlement of public lands under the homestead and other laws, have operated to decrease range herds of both sheep and cattle, the total number of cattle has been nearly maintained through the fact that farm cattle have increased to largely offset the decrease in range cattle. The heavy sales of cattle during 1923 to '26 to liquidate indebtedness reduced the total number of stock cattle about 275,000 head, while there was considerable increase in dairy stock. The 1928 census places the total cattle



Present-day beef herd. Custer National Forest. Average weight 1200 lbs. Mostly 3 year olds. Present price in Chicago 12c to 14c per pound.

population at 1,117,000, but with good prices ahead it seems very probable that the 1923 level will be reached by 1930.

The crash and forced liquidation in the sheep industry in 1919 and '20 directly following the world war reduced the sheep population to around 2,450,000, the lowest level since 1890. The very good prices for wool and lambs has given the sheep business a boom, and the latest census places the sheep population at about 3,761,000, a new high level, and is only exceeded by Texas and California. The number of small farm flocks, 50 to 200, has greatly increased during the past four years, and has played no small part in the general increase in Montana, and probably elsewhere.

The total land area in Montana is in the neighborhood of ninety-three and a half million acres. Of this, thirty million acres have been classified as farm land, twenty-six million as mountain and forest land and the remainder, grazing or waste lands. In the period 1900 to 1910, during which the total numbers of livestock in the state were at a maximum, there was open for unrestricted grazing an area of public lands in the state varying from about seventy million down to forty million acres. In 1923 the area of public domain land open for entry had shrunk to the neighborhood of five and a half million acres and there were about sixteen million acres gross of Federal land in National Forests, and two or three million acres of Indian reservations, a large percentage of which was open to the grazing of domestic stock. It will be seen from these figures that the public range available has decreased by about two-thirds since the beginning of the present century and this obviously is largely the controlling factor which has operated to reduce the number of range stock. According to census reports, there are approxi-

mately thirty-seven million acres of grazing lands in private ownership and in add tion, about twenty-three million acres of land classified as agricultural but not under cultivation. The following list shows the acreage of land which has passed to patent under the various land acts up to and including June 30, 1922:

Desert Land Act	2,731,937 acres
Stock-raising Homestead Act	3,660,836 acres
Under the Homestead Act	47,882,838 acres

Public grazing lands are now limited to approximately 8,000,000 acres suitable to and open for use by domestic stock in the National Forests; lands available on Indian reservations and those portions of the five and a half million acres of unreserved public domain which are adapted to grazing purposes.

The records for 1922 show approximately fifty-two million acres private lands existing in the state. Thirty million acres of this are classified as farm land but only about 7,000,000 acres are in cultivation; that would leave approximately forty-five million acres grazing lands under private ownership or an area of grazing lands in private ownership approximately three times that of grazing lands in public ownership. Indications are that there will be a fairly rapid decrease in the acreage of public unreserved lands which are available for grazing purposes. The number of original homestead entries in 1922 in the state was 4970 and there were patented during that year 2,521,788 acres. It is easy to predict, therefore, that the public grazing lands will be more and more limited to those areas included under one form or another of Federal reservation and such grazing lands as are owned and leased by the state.

As a very general approximation it may be stated that there are something over sixty million acres of usable grazing land in the state at this time. Approximately seventy-five per cent, or forty-five million acres, of this land are in private ownership. Of the other twenty-five per cent, thirteen to fifteen per cent, or about eight million acres are in the National Forests. About ten per cent is in unreserved public domain and Indian reservations and around one per cent owned by the state. Range stock are distributed in something like the following portions: About twenty-five per cent of the sheep in the state and fifteen per cent of the cattle, other than dairy herds, graze for a portion of the year on the National Forests. The remainder of the grazing is on private, state and unreserved public domain.

Market Trends as Affecting Range Livestock Producer.

During the early days the market favored the heavy, aged steers, while mutton, as contrasted with lambs, was a much more important market class than at present. Gradually the situation has changed to the other extreme. The investment in land, range improvements, and in the breeding herd has increased enormously. Free range has practically disappeared and pasturage costs

Typical beef herd of Texas longhorns of the early nineties headed for market. Weight 800-1000 lbs. 5-7 year olds bringing 3½c-4c in Chicago.

have doubled and trebled. Labor costs and all fixed charges have likewise increased. The market in general discriminates against heavy, coarse beef from aged steers. Cattle producers have not followed this market trend to the required degree and have in consequence been penalized accordingly. This situation calls for analysis and vigorous reorganization to get back into agreement with economic tendencies.

By market grades and classes as here used is meant primarily, quality, condition, and finish as judged at the market, rather than breeding, although breeding does have an influence on the market class.

The Chicago Fat-stock Show discontinued the 3-year-old steer as a class in the early 90's. This marked the definite turn in the trend from heavy to lighter beef. Industrial centers that formerly demanded large quantities of chuck beef from coarse, aged steers and cows are now demanding a high quality and smaller cuts of meat. Even outside the industrial sections, the housewife, with her kitchenette, generally desires smaller cuts of meat, which favors lighter, better finished steers as against the larger cuts from heavy, coarse steers.

Twenty years or more ago a much higher proportion of the wethers and aged mutton was slaughtered than at present. Today the matured mutton that reaches the market is largely a by-product. Wethers have almost disappeared from western ranges, except on public domain where they are used as buffers

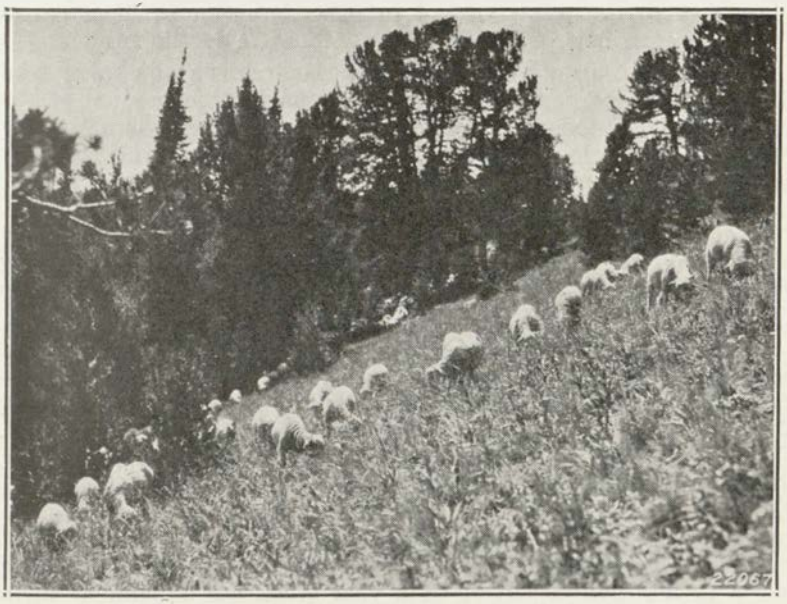
in range disputes. Their place has been taken by lambs. In fact, the western sheep industry is now organized largely on a lamb producing basis. The character of the demand for lambs has changed in recent years also. Formerly, the heavy lambs were favored, but of recent years the market demand has been for the lighter, well finished, "sappy" lamb weighing from 60 to 70 pounds, rather than for those weighing 80 and 90 pounds. Western sheep producers have, in general, been quick to follow this demand and have organized their operations to supply the public with the choice light-weight lamb, and have profited by the change.

Importance of Quality, Conformation and Finish.

Quality, conformation and finish are in general of greater importance from a market standpoint than the age or weight or even the breeding of the steer. The value of purebred sires and the culling of least desirable females in raising the quality of cattle is unquestioned and is well recognized generaly in the West. Adverse climatic and feed conditions do, however, limit rather definitely the benefits from purebred sires on many of the arid ranges. It is not intended by this to discourage the use of improved sires, but to emphasize the fact that this alone will not insure the conformity to the higher market grades that are most profitable. Good breeding must be reinforced by ample feed to allow the animal to develop its latent possibilities before a satisfactory price is possible at the market. This simple fact has not been fully recognized or generally followed.

Overstocked Ranges Will Not Produce Beef or Lamb of Quality.

This situation all has a direct bearing on the question as to what constitutes proper forage utilization on the range. Overstocked ranges will not produce beef or lamb of the quality and finish demanded by the consuming public, but more conservative stocking of the ranges will enable the western cattlemen to produce a grade of stock that will command a better price on the market. The fact that range steers sell on the Chicago, Kansas City, and other primary markets at half or less of what prime corn-fed steers of no better breeding sell for on the same day, illustrates the importance of finish. This spread between prime corn-fed steers and western range cattle has come to be a major range production problem. It cannot be expected that a method of range utilization, even if supplemented by hay or other roughage, will produce a steer that will command the same price as prime corn-fed steers. Numerous progressive stockmen have succeeded, however, in producing under range conditions a class of stock that, because of the desired age, finish and breeding, will command a price of $8.50 to $10.00 per hundred, as compared to steers of similar breeding but of inferior finish which sell for $6.00 to $6.50 on the same market at a time when prime corn-fed steers commanded up to $12.00 per hundred.



Where the fat lambs are made and range conserved. Jefferson National Forest.

Western Ranges Produce Small Percentage of Slaughter Cattle.

Accurate figures showing the proportion of western range cattle that are classed on the markets as feeders and stockers or as cutters and canners are unfortunately not available. Such statements as the following in weekly market reports are, however, significant—"The bulk of western grass steers at the central markets have gone back to the country for further finishing." Records kept by the United States Department of Agriculture[1] show that during the five year period ending in 1920, about 20% of all cattle received at the 67 markets were returned to the country for further feeding. A considerable number of cattle appear at the central markets and are shipped back to the corn belt for finishing. Probably less than 50% of the cattle that reach the central markets from western ranges are classed as killers and butchered without additional feeding and finishing. The beef of poor quality from western ranges is greatly increased by a large number of stock that are classed as cutters and canners and sell for about half the price as feeders. Some of the cutter and canner cattle are old cows, but much of this class of stock would go into a higher price grade if they carried more finish.

The fact that such a large proportion of these western range cattle are classed as feeders and stockers, or cutters and canners,

[1] 1921 Yearbook U. S. Department of Agriculture, page 286.

gives rise to the great spread in price between finished cattle from the corn belt or elsewhere and those from the ranges.

With this situation confronting the western stockmen who depend on range pasture lands for a considerable portion of the year, supplemented with stored feed for short periods of winter feeding an who looks on his business as one requiring stability and permanency, the question "What constitutes the proper utilization of range or pasture" is a mighty important matter. The question must also be answered in some way or another by all who may be charged with the responsibility for administering ranges on the basis of sustained yield and permanence of the forage.

The fact that many ranges have in the past been overgrazed and depleted to such an extent as to cause very serious disturbance in the livestock industry is ample proof that the question has in many cases been fully answered. On the other hand, the planting, harvesting, and otherwise caring for hay, grain, and other stored forage crops has been given a lot of consideration by stockmen and farmers. Agricultural Colleges and Experiment Stations have helped to solve many problems and great progress has been made with this class of forage. But since from seven to ten months out of each year stock are dependent upon forage from natural pasture, it is evident that more thought must be given to this part of the livestock operation.

WORK

Let me but do my work from day to day,
In field or forest, at the desk or loom,
In roaring market-place or tranquil room,
Let me but find it in my heart to say,
When vagrant wishes beckon me astray,
"This is my work; my blessing, not my doom;
Of all who live, I am the one by whom
This work can best be done in the right way."

Then shall I see it not too great, not small,
To suit my spirit and to prove my powers;
Then shall I cheerful greet the labouring hours,
And cheerful turn, when the long shadows fall
At eventide, to play and love and rest,
Because I know for me my work is best.

HENRY VAN DYKE.

1906—1929
A SKETCH IN TWO PARTS—THEN AND NOW

By A. D. Read, De Riddles, La., of Long Bell Lumber Co.

In writing a "piece" for the Annual of the graduating class of today one recalls his own graduation. Irrespective of the old days being good or bad it is certain that conditions in the forestry profession were much different twenty years ago from what they are today.

In 1906 there were only two forestry schools—Yale and Biltmore. In those days it was almost a confession of weakness to admit that you were a forester. A forester was visioned by the hardboiled lumberman and cowman as something his dogs had drug in from the swamp; a miserable specimen of humanity who knew very little outside of books—'one of Pinshots boys' was one of the milder epithets given us by the cowmen who were smarting under their first grazing fees. We avoided as much as possible the loud and rude guffaws by hiding under the nome de guerre of Forest Engineer with probably about as much success as the New York East Sider who, covering his nose with his hand says, "Guess who I am, Ikey."

Then a job was easy to get but there was no large field to choose from. The U. S. Forest Service and the Philippines comprised the list—no industrial forestry, no university faculties, no state work—Government work only and almost without exception it was administrative. Salaries of course were smaller but that does not spell anything; as much or more could be bought with the beginners salary of $1,000.00 then as can now for $1600.00 or $1800.00.

The National Forests themselves in 1906 to 1910 were nothing like the present well groomed affairs, with smooth, well maintained roads, broad, posted trails so that a traveler knows all the time where he is going and how far it is to there; picturesque fireplaces on which to fry bacon and boil coffee—or is it always carried in thermos bottles now?—telephone lines in all directions; smart, natty, clean-shaven rangers in uniform, sallying forth each day, in a Ford or better, from a government-equipped and maintained ranger station, to direct traffic.

Yes, times have changed. I understand that prospective rangers do not have to show their proficiency in throwing the diamond hitch in their ranger's examination now. In the first ranger's examination held in 1905 or 1906, the entire outfit adjourned to a nearby canyon where each contestant had to fell a 16-inch tree. I can remember another examination in Gallup which would have been a dull affair if the horse used for the riding had not been inclined to crow-hop a little. A ranger was chosen then for his ability to get back to camp each night after a day's work over dim and little known trails. Neither rangers nor supervisors ever thought of shaving in the sticks for then the trails were not all cluttered up with tourists. About

the only people to be met in the mountains were either one of the aforesaid rangers, a more or less honest rancher, or a sheepherder who could be easily identified by the fact of his wearing but one spur and that on the wrong foot and upside-down.

At that time all the forests were not even created and to many of us fell the enjoyable experience of putting the new ones under administration—correcting the first rough maps, putting the stockmen on the straight and narrow path and learning who were the friends and who were the foes of the Forest Service.

As I recall those days it seems that the principal topic for discussion was whether or not uniforms should be made compulsory, whereas now it is largely about the forestry schools.

The entire matter of forestry in this country, having its beginning 25 years ago, has certainly made great advancement. Progress in which all foresters should be proud. Consider the growth of the state forestry departments—from zero to almost 100 per cent. Industrial forestry which is going ahead so rapidly that data gathered twelve months ago is now hopelessly out of date. The general attitude of the public. No such questions now as, "But what is forestry?" The only comments which arise when one boldly and proudly states that he is a forester are, "Well, it must be an interesting job," or "you are certainly in a constructive line of work."

Forestry and the Forest Service formerly were synonomous but today that is not so. The profession has outgrown it. The Service is settling down and largely becoming standardized but Forestry itself is still young, hence intensely interesting. So many research problems to be studied and investigated—many of them very tangible and concrete—in silviculture, management and nursery practice; such a long way yet to go in industrial forestry. So much in the future that is still unknown. Even the timber famine croakers, refusing to be rebuffed by facts or discouraged by failure of past prophecies are taking heart again and are breaking out with a fresh crop of wails and worries, ignoring the fact that Rome was not built in a day. You are right. Forestry has been in the past and will be for a long time in the future, an absorbing profession for the mind and body.

An old grandpap sitting in his chair by the fireside is supposed to tell all about the good old days and from the realms and depths of his experience propound excellent advice for the youngsters who, however, never follow it, but learn for themselves. So I will save myself the trouble of giving any advice or rules to follow except for that first given to a group of us by Fernow. "Always remember the three F's: Forestry, Fun and Family." This is a good professional motif and one which I believe, considering foresters for the past 25 years, most of us have followed. Keep true to these three F's and success is sure to come.

SOME NOTES ON FOREST SCHOOLS AND SCHOOL CURRICULA

T. C. Spaulding, Dean, School of Forestry

Forestry has now reached an age of ripeness and experience that demands introspection on the part of the profession. The crudities of pioneering are done; the hurly-burly of expansion has given way to the solidity of performance. Wisely the profession is taking stock of itself and within itself and among the subjects under criticism, constructive and otherwise are the Forest Schools, Forest School curricula and Forest School functions. Much of the criticism is deserved. None of the comments, however, touch upon basic principles, nor do they grasp the primary functions of a School, rather they reflect the idiosyncrasy of the individual in his peculiar need for men of definite capacity or his desire to have the schools supplement his line of specialization. The interrelation of school and profession is so complex and extended, I shall do no more than jot down a few observations, reserving extended treatment to a later date.

1. *What* are the objectives in professional training? The function of the *School* is that of granting an adequate preparation to the student
   (a) In professional subjects that the student may enter the field of forestry with a well grounded mastery of its basic principles and a general knowledge of its technique.
   (b) That he may take his place in the nation as a citizen.
   (c) That he may appreciate and comprehend those things in life best expressed as its culture, art, music, the drama, literature, the sciences and the professions.
   (d) That in him may be inculcated the principles of morality and right living.

Those are the things that should be given the man in his education. I do not say *could*—but *should*. My thesis is that the Forester, of all men, owing to the complexity of his task, must be of rare calibre and possess a wide understanding of life in general. The attainment of this objective cannot be had in narrow curricula or under the guidance of those who in themselves do not measure up to the moral, cultural and professional standards implied.

2. The School as an Institution. It has as its functions
   (a) First of all that of *teaching* (education) and if it successfully attains this end it has fulfilled its basic obligation to the profession and the State.
   (b) A responsibility to the people of the State as a leader in Forestry and in the solution of their forest problems.

(c) Granted the successful accomplishment of these, then it may devote its energies to fundamental investigation of general or local import.

Too many institutions, and I do not refer to Forestry alone, have departed sadly from their primary function, through pressure or myopia, or by following the line of least resistance, and in an attempt to dazzle, have made a research or public service institution out of an organization created for what possibly might be called an alien purpose. Unless an institution has sufficient capital to provide adequately for each of the functions, any attempt to spread funds and faculty over the diverse fields means decreased efficiency in the others, i.e., incompetency. The primary function of a School is *Education*—Forestry instruction—and the profession has the right to demand the School subordinate all other activities to this function. It is far more important to the profession that the Schools feed it soundly prepared young men of the right calibre than that they, subservient to pressure, or staff inclination, plunge into minor fields. Any staff member finds a much more agreeable task in devoting time and energy in investigation or public service than in the drudgery of instruction or grading quiz papers; in devoting two hours in the research laboratory rather than spending the period in preparation for an hour's lecture. Unless an institution has the finance to divorce the functions by organizing special staffs or by lightening teaching loads (not always a solution), it fails as a School whenever multiple objectives are undertaken.

There has been much recent discussion in the Journal and elsewhere anent forest education, most of it beside the point, and all of it similar in tenor to contemporaneous articles in the allied professions. The man whose natural inclinations demand painstaking delving into fundamental truths rarely has the basic qualities of a true teacher—the power to ispire youth; the patience, the sympathy, the tolerance, the enthusiasm for others and the ability to correlate subject matter and mentality. Yet many Schools are bending to pressure and are selecting staff members, first on their records as investigators, and but incidentally on their known or potential value as teachers. Riper experience in pedagogy and possibly a dissatisfied profession will in time furnish the remedy. I do not mean to infer that the teacher type of forester is to completely forego investigation in his own field. It is only by production that he can keep abreast of his subject; but production must be incidental to sound teaching.

In the preceding notes I have attempted to define the objectives in professional training in the School and in the instructor. Returning to the objectives in professional training, the curriculum must provide for the mastery of basic principles and the attendant technique in professional subjects as well as furnishing

(Continued on Page 67)

LONG-EARED ANGELS

By Richard Delaney, Former Lookout, Kootenai

It ain't human to expect a man to swing an axe and grubhoe for forty-eight hours without no sleep or nothin' to eat, not to mention the heat and the smoke and a boss what's always on hand when you start to take a five. Bein' a man of considerable education, why I didn't like fighting no forest fires anyway. I never lost any.

I was drunk or I wouldn't of got in such a fix but the fellow told me about it in such a sentimental way that my eyes filled with tears at thought of future generations not having no trees or no houses or nothin'. He seemed to feel real bad about it too so I suggests we go to a place I know and sip of the milk of the wild cow but he says he hasn't time and, if I'm goin' to do my duty, I got to ship right now 'cause the train won't wait and anyway, if I don't go right now, there won't be no trees to save and the rest of the babies will have to be born in hammocks because there won't be no wood for cradles.

So he gives me a ticket and I gets on a train only it's the wrong train so I gets on another and, being sleepy like, goes to the arms of Morphus. Bein' educated, I knows that Morphus is the twin brother of sleep. The next I know is when the train is wrecked but it wasn't wrecked. I see that the fellow that is shaking me has on a sort of uniform and I notices a badge. "Pat" thinks I, "you're pinched for being drunk and disgraceful." Then the fellow shoves me into a truck with a lot more who must of been drunk and disgraceful and I goes to sleep again.

Next time I woke was when the ground come up and hit me. It made me mad and I got up ready to fight but my legs was kinda unsteady and I sat down.

"C'mon there Pat" says a voice and there was that badge and uniform fellow again. "We got to hike" he says and I notice a string of men hiking off on a trail into the woods only there ain't no trail.

"Where am I" I inquires polite like?

"You're on the Seemore National Forest" answers Uniform kinda nasty "and you are going to the Eleven Mile Fire and you are going now, or—" I didn't like the way he drew his foot back when he said that so I got up and started to follow the rest of the men over that trail, only there wasn't no trail, and Uniform tells me to carry an axe and grubhoe before I start.

We climbed up a mountain that must have been ten miles high and when we gets to the top, I couldn't see no fire which I remarks to Uniform. Then he points to a whole bunch of smoke on top of another mountain which is so high that the one we are on looks like the bottom step of a long ladder. When I seen that

I fell down but Uniform gives me a mean look and I got right up again.

Not liking to talk of things that ain't pleasant, all I'll say about getting to that fire is that I lost twenty pounds of good flesh and one pant leg. And the only reason I didn't kill Uniform was that I was afraid the other fellows would get lost if he wasn't there to guide them.

Well, we gets to the fire and I know the reason it is named Eleven Mile is because we have had to climb a mountain eleven miles high to reach it. But we gets there and I says "when do we eat" and starts to lay down but Uniform says to bring my axe and he'll show me where to begin work. Now Pat Murphy, that's me, could of showed Paul Bunyan how to use an axe but, bein' sleepy and everything, I didn't see a little branch which reflected the axe so it didn't hit where I was lookin' but took off my other pant leg. Then Uniform gave an ugly snort, mumbled something about the type of men sent out to fight fire, and give me a grubhoe. I ain't no badger and I didn't have no regard for one of them widow-makin' things—of course that is one of these here figures of speech, because me, I'm too sensible to be married—But Uniform is right there with that nasty look of his and he says "Pat, you are going to snap into it or I'll just simply beat h—l out of you". I could see he was game enough to try it too and, not wanting to hurt him, I starts makin' the dirt fly and he leaves me alone for a while.

But I notice, everytime I straighten up to kinda ease my back, that Uniform is watchin' me and his look keeps gettin' dirtier all the time.

All the time I gets sleepier and hungrier and I don't care so much if there won't be no more rollin' pins for wives to throw at their better halves. Once I asks Uniform when we was going to eat and he says that men was building a trail into the fire so the packstring could bring grub in. I asks what a packstring is and he says that this one is going to be Long-Eared Angels when they gets here which will probably be a couple days. And I says, if they don't get here before a couple days, Pat is going to be a winged angel. But I didn't say it so he could hear. I was beginnin' to like the fellow and he seemed to have a lot of troubles so I didn't want to hurt his feelin's.

A man can't fight fire for two days without no sleep or nothin' to eat except smoke and dust but we did that even if it ain't human. The crew was beginning to look sorta down and out but we kept goin' just for Uniform. Not that we were scared of him but he had that kind of sex appeal you hear about. Nobody knowed what it was until some educated person like me, figured out that it was It. That's why we kept goin' for Uniform. He had It.

On the second day, Uniform comes to me and says "Pat, you're a man I can trust so I am going to let you patrol the line

we have built. Stay awake and see that no fire gets on the wrong side of that line. And if I catch you asleep on the job, you'll wake up where the fires never go out."

I was seein' all the fire I cared about so you can bet I didn't go to sleep. Then that packstring was supposed to get in anytime and you won't ever find Pat Murphy asleep when there is something to eat comin'.

I knew all about fighting fire by this time. You cut a trail through the woods and then you dig a trench in this trail. Then you work a bluff and start a fire of your own on the side of the trench where the real fire is and your fire scares the real one so bad that, when they run into each other, they both go out. Only they don't do it all at once but sorta hang on in patches and throw sparks just for orneriness. Just to show you how ornery a fire is, it's like a woman, always doing the unexpected and can's never be depended upon. My job was one which, like Uniform said, only a trusted man, like me, could handle 'cause I had to watch close to see that none of them sparks started fires on the wrong side of the line when we would have to start all over again and build another line.

I got to thinkin' it was like a war only there wasn't no goldfish and the fire was the enemy and here was Patrick Murphy who was trusted to see that no enemy patrols got a foot-hold across the dead line. So I took up my belt another notch, only all the notches had been taken up. Then I got to noticein' that the wind was blowing hard and ashes was droppin' all around. What got me was that the ashes weren't comin' from where the fire is. I'm tryin' to figure it out when I hears a yell and I see Uniform comin' on the run like the devil was after him. "Horay, the grub has come" I think and start to meet him.

"C'mon Pat" he yells, all the time runin', "we've got to get out of here" and when he says this he slips and falls down. Then he gets up and falls down again.

"Beat it" he says when I reach him "toward that rocky point" gesturing. "The fire swept around the end of the line when the wind changed. The crew are safe but I came up here to warn you and I've twisted my ankle but you've just got time to get out".

Having a very quick mind, I could see just what had happened. The enemy had sneaked a march on us and stolen around the end of the line, everyone bein' too sleepy to notice much, and the wind had spread it out so that me and Uniform was in a sort of horseshoe of fire with the gap closin' fast which would make it a circle of fire. Then the circle would grow smaller and smaller until there wouldn't be any circle and I sees, too, when I stoop to pick up Uniform, how old and tired his face seems even if he is a young man.

"Go on" he growls with that nasty look of his, "you just got time to make it if you leave me".

"You go to h—l" I says, and give him a look just as dirty as I picks him up.

"We probably both will" he answers and grins that grin what shows he has got IT.

I tries to run but Uniform ain't no lightweight even if he ain't had nothin' to eat for a long time so I don't go very fast. And the smoke and ashes and sparks keep's gettin' thicker and that makes it all the harder. Finally I don't know whether I am goin' or not but we reach the gap only there ain't no gap because the fire has beat us, so I stops and sets Uniform down to catch my wind and think. But there dosen't seem to be anything to think about except some of my past sins. Then, above the racket of the fire, I hears a noise what seems familiar but I can't just place it so I ask Uniform.

"That" he tells me "is the Long-Eared Angels with grub but you and I will be meeting angels of another kind. I wonder if angels eat" he asks wistfully of no one in particular?

"Grub!" I says, "and just a little fire between us and it? Buddy, you don't know how hungry Pat Murphy is", and I picks him up again and starts for that grub. Besides, I was curious to see what them Long-Eared Angels was like.

The enemy hit us with red hot bayonets and the smoke filled my eyes with tears so I couldn't see and I almost fell down. But I says "Pat, you'll never forgive yourself if you die on an empty stummick" so I keeps going. There is a strange roaring sound all about and I'm getting awful sleepy when I run into a wall, only it's a tree, and, as I bounces back, hear a shout so I know we are through the enemy's lines. Bein' tired from not havin' had no sleep for forty-eight hours, I lays down, only I am already laying down, and goes to sleep.

The smell of cofee wakes me up and I know I'm in heaven because there ain't no coffee on the Eleven Mile Fire. "Pat" I thinks, "you're a lucky stiff to land in heaven" and then I opens an eye to see what the place is like. The lids feel like they was glued together but I get it open and, lookin' me right in the face is the meanest lookin' mule I ever saw. So I opens the other eye and there is some more mules. Then I sits up and see big piles of grub, an' kettles steamin' over an open cookin' fire, an' men sprawled about, and there is Uniform, only there ain't much Uniform left, talkin' to a hombre in one of these cowboy hats. So I know I ain't in heaven. And I see, too, that Uniform meant mules when he says Long-Eared Angels. Being quick minded, I knows right away that he said it right.

Plate I
Conifer seed beds before shelter belts had been placed.

THE FOREST SCHOOL NURSERY

By Carl F. Beall

The establishment of the Forest School Nursery was originally in answer to a long felt need for a laboratory where forestry students could obtain some practical silvicultural training, but it was later expanded and moved to its present site, and placed under the operation of the Clark-McNary Act.

The need for an agency for the promotion of forestry, farm woodlots and farm shelter-belts, particularly in those portions of this and many other states where timber is very scarce or entirely wanting, led to the passage in 1924 of the Clark-McNary Act, which provided "for the protection of forest lands, for the reforestation of denuded areas, for the extension of national forests, and for other purposes, in order to promote the continuous production of timber on lands chiefly suitable therefor."

Under section four of the Act, the Secretary of Agriculture is authorized and directed to cooperate with the various states in the procurement, production, and distribution of forest tree seeds and plants, for the purpose of establishing wind breaks, shelter-belts, and farm woodlots upon denuded or non-forested lands, within the cooperating states, under such conditions as may be prescribed. The amount expended by the Federal Government in cooperation with any state during any year for this purpose shall not exceed the amount expended by the State for the same purpose, and Congress appropriates $100,000 annually to carry out the provisions of the Act.

The State of Montana having aligned itself in this constructive program appropriates a sum ranging from $2,000 up each

year to which the Federal Government adds not more than $2,000, totalling $4,000 or more, available annually for the specific purpose of providing planting stock to the farmers for their shelterbelts and woodlots.

Probaby the most important reason for the location of the Clark-McNary nursery at the University, under the direct administration of the Forest School, was that, its purpose being to raise forest trees, the faculty silviculturist would better understand its needs and management. It would at the same time afford a splendid opportunity for the training of Forestry students in practical silviculture and nursery work.

The development of the nursery during the past two years has been remarkable. From a barren 10 acre plot to the largest school nursery in the United States, embracing approximately 20 acres. Plate 1 shows the confier seed beds before the shelter belts had been placed; plate 2 shows the same beds one year later, protected on both sides by shelter-belts of 2 year old boxelders; and illustration 3 shows the flower beds from which the dormitories obtain fresh flowers for the tables. Plate 4 shows the boxelder hedge and windbreak at the age of 3 summers. These boxelders were transplanted from the old nursery, up behind the University.

As Montana climate goes, that which Missoula and its surrounding region enjoys is considered to be mild, as indicated by such a name as, "The Garden City". On the whole conditions are very favorable to the growth of young trees for the sub-zero temperatures are within reasonable limits, scarcely ever going lower than 20° F. below, and the high summer temperatures are seldom over 90°.

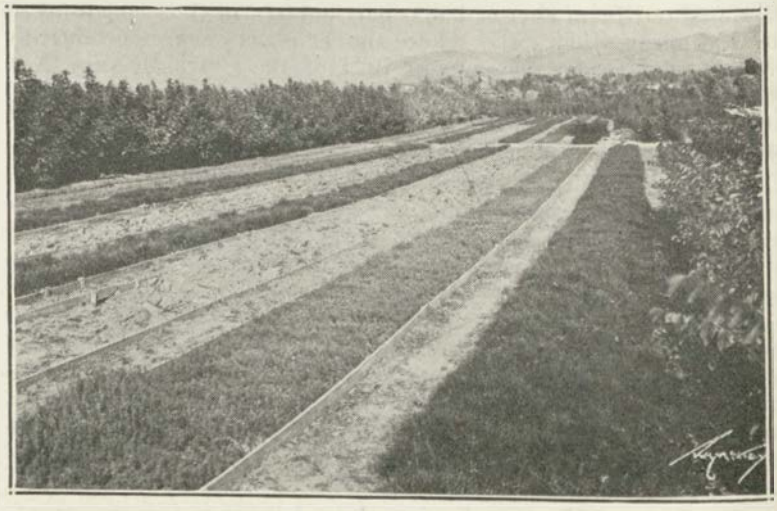


Plate 2
Same beds as Plate 1 with shelter belts of boxelders.

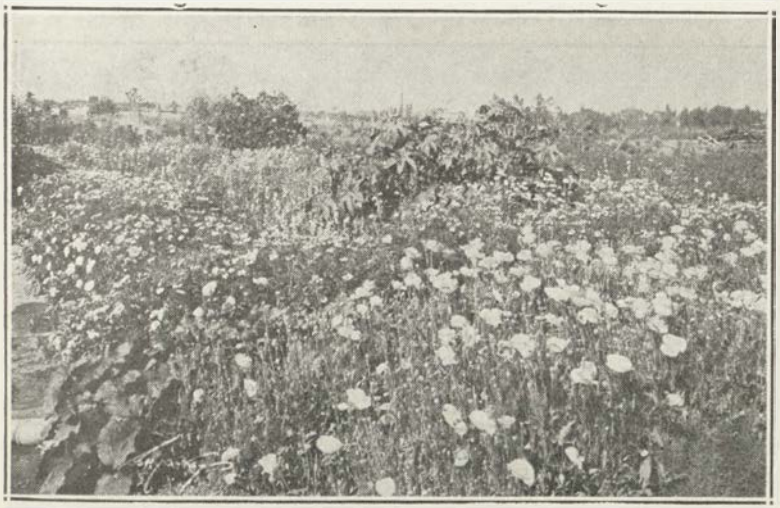


Plate 3
Flower beds. Dormitories get supply for tables here.

The range of temperature is much less a factor with which to contend than are the winds. The east wind coming out of Hell Gate Canyon, tho generally cold, is a beneficient factor, for it prevents the occurrence of many frosts, thereby actually lengthening the growing season. A mile away where the effect of the wind is not felt, the growing season is two weeks shorter, due to the occurrence there of heavy killing frosts.

The southwest wind, which blows in from over the Bitter Root mountains, is a hot, dry wind, and prevails throughout the summer, resulting in insufficient precipitation, quick drying of the soil, and dessication of the plants. The 13 inches of annual precipitation must be supplemented by continual early morning and late evening sprinkling, which, because city water is used, is expensive. The shortage of water during the late fall when the young trees are heeled in is another source of concern, for they can easily be permanently damaged by excessive drying at this time.

The soil is a deep alluvial clay silt with frequent pockets of rocks varying in size from 2 to 5 inches. Some of the ground is filled in over an old dump and drains rapidly resulting in patches which exhibit all the characteristics of semi-arid conditions. The original vegetation was a sparse commune of weeds and wheat grass which resulted in a soil practically barren of humus. The presence of considerable clay combined with the lack of humus results in baking and cracking which opens the soil to quite a depth, drying it, decreasing capillary action, tearing roots and hindering the growth of the young stock. To overcome this difficulty it was found necessary to mix leaf mold into the soil

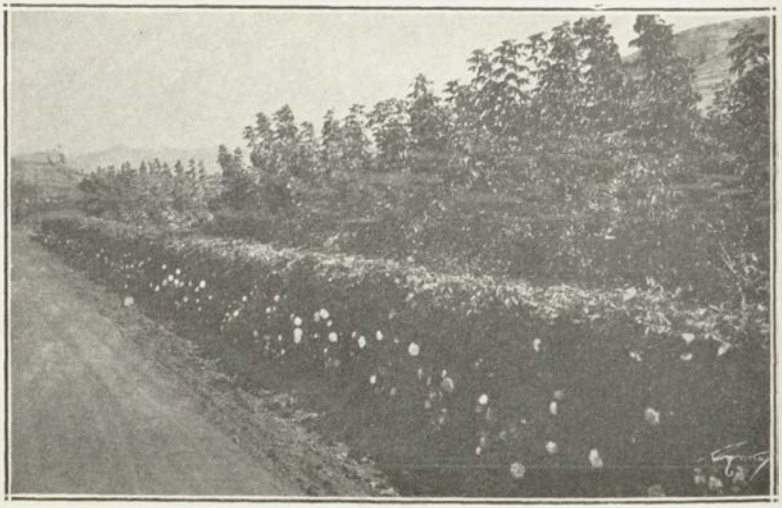


Plate 4
Boxelder hedge and windbreak. Age 3 summers.

of the seed beds with a generous portion of fine river sand. Well rotted stable manure is used to humify and fertilize the field portions. Several years will pass before the soil can be brought to a really satisfactory loamy condition. If the trees survive, even grow thriftily here, it is pretty certain that they will survive at other places if cared for at all.

The nursery crop ranges all the way from a quantity of ordinary garden truck which is furnished to the dormitories to flowers and trees. A few ornamentals are raised which will be used to beautify the University campus but since it is not intended to compete with commercial nurseries only enough for local wants are raised. Many species are grown experimentally but relatively few are grown on a quantity scale for distribution to the farmer. Of the latter class can be mentioned, among the conifers, Western Yellow Pine, Eastern Jack Pine, Scotch Pine and Norway Spruce. The important deciduous species are: Caragana (Siberian pea), Green Ash, American Elm, Chinese Elm, Cottonwood, Russian Olive, Golden Willow and Box Elder.

All have been found suitable for the semi-arid condition existing in the eastern and northeastern portion of the state. The Canadian poplar becomes diseased when about 12 years old and is thereafter more or less unsightly. The Chinese elm tips back in the winter some but makes as rapid growth as the cottonwood and is a prettier tree. It is a more symmetrical tree and faster growing than the American elm which is, however, the more hardy of the two.

Catalpa was tried but due to freezing back in the winter there was never much more than a year's growth above the ground. Its broad leaf surface would probably unfit it for existence in the dry portions of the state anyway due to unbalanced water relations.

In all, about 300,000 trees were raised for distribution this year at a cost of $6,148.00 plus land investment. Caragana, which is used for windbreaks, is the leader with box elder and American elm following closely. It is estimated that over 500,000 plants will be necessary next year.

The trees are shipped to farmers throughout the state, who make application through the State Extension Horticulturist at Bozeman. They must agree to plant and care for the stock under the supervision of the county agent and the trees are sold to them at cost plus transportation.

Student labor is the chief means of getting the work done even in summer. It is probably a little more expensive than local common labor would be due to its transient nature and need of close supervision but the additional cost is compensated by the training received by the students and the fact that many of them can earn a part of their school expenses thereby.

Those who have seen the treeless plains of the west can well appreciate the important part that such nurseries will play in the development of farmsteads. From a bleak, rather cheerless windy place can be developed a home protected from the wind by a tall windbreak of fine green trees which, if some conifers are used, will serve in winter and in the summer. Certain species when property used will in 10 to 15 years time provide shelter for the livestock and cool shade will be provided from the blasting heat of the sun and the aesthetic values about the farm can be realized.

MY FRIENDS, THE TREES

The oak is King of the forest,
The birch is his queen,
The pine is a sturdy squire
In garment of green.

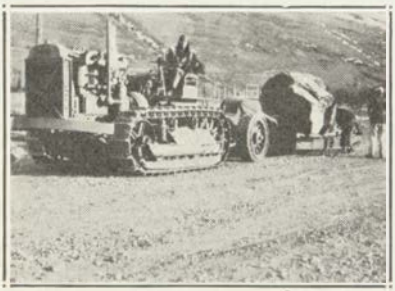
Pear and apple are peasants,
Gnarled, old growers of fruit;
And the poplar is a gentleman
From nodding head to root.

The aspen is an actress
Who flirts with every breeze.
There are all sorts of characters
Among my friends, the trees.

JULIAN M. DRACHMAN.

PAUL'S NEW OX

By I. W. Cook



Ten ton Kirkwood Memorial Stone.

The University of Montana's School of Forestry has been honored by being the first forestry school in the world selected by the Caterpillar Tractor Company for cooperation in working out modern logging methods. One of the "Caterpillar" logging cruisers of the latest model has been placed by the Petrie Tractor and Equipment Company of Missoula, on the loan plan similar to Caterpillar Tractor Company's loans of their equipment to Agricultural colleges. The tractor is replaced each year by a new model.

Tractor or "Cat" logging is scarcely five years old in this region. It has passed through the experimental stage. Now there is "ground skidding", "pan skidding", "chute trailing", camp moving, Athey wheel bummers, road building, bridge building, snow removal and many other jobs around a lumber camp which speeds up the work and multiplies each man's output for greater profit and less destruction of young trees. Caterpillar logging makes possible selective logging and good forestry, while permitting practical cutting of timber by the owners.

Most of the principal loggers of Montana are using Caterpillar tractors on their operations.

The Forest School is using the Caterpillar tractor for class work in teaching "Cat" driving, servicing, repairing, mechanical construction and experimental work.

SWEDEN AND SWEDISH FORESTRY

By Dr. C. A. Schenck, Forester

On the third day of the creation, the firm lands were separated from the unstable waters; on that day, by some oversight, Sweden seems to have been overlooked or neglected. As a consequence, Sweden is dipped in water, to the presnt day, is permeated by water, is dissected through water, is flooded with water; and all folks of the upper classes are wearing rubbers, continuously, while all uneducated folks are wearing, just as continuously, tarred high-boots; indeed, Swedish life is amphibious—all due to an oversight made on the third day of the creation.

There are some other and more important consequences of that creative oversight: SWEDEN IS THE CLASSIC LANE OF FORESTS. The union of earth and of water *is* the cause of forests. The separation of earth and water *is* the ruin of forests. In Sweden, earth and water are inseparable.

Skogen—Sverige's styrka!

Translated, this Swedish slogan signifies this: "The forests are Sweden's strength."

This idea, this truism, this slogan was the Leitmotiv at the most glorious forestry-festival that was ever pulled off, anywhere, at any time; it was pulled off in Sweden, on October 15, 1928; I had the honor at that occasion to represent the forest school of the University of Montana.

I have attended, some 25 years ago, a huge forestry congress in Ottawa: Sir Wilfred Laurier was presiding; the high and mighty Dominion were present; it was a grand affair.

About the same time, summoned by President Roosevelt, there was a forestry congress in Washington, D. C., attended by thousands of invited guests, myself included; it was a huge assemblage. The best speakers were speaking, the best minds were thinking, and the crowds (in which the females prevailed over males) were enthusiastic.

Three years ago, there took place a gigantic world's congress of forestry in Rome; again, I was present as the representative of Montana; there was the king, there was Mussolini, and there were the best foresters of the world. It was a magnificent gathering.

And yet—what were these congresses, assemblies, meetings, and celebrations? Circuses they were; theatricals they were; parades they were, all planned and staged for forest-propaganda.

At the Swedish forestry festival of October 15th last, things were different: This festival was occasioned by the centenary of the Swedish school of forestry; but it was celebrated by the *entire* Swedish people. There was no staging. The dean of the school, famous Tor Jonson, was pushed rather than pulling. The heart and the soul of all Sweden was celebrating a festive jubilee with the school and with its guests.

Forest festivals of this type cannot be celebrated by other countries, excepting the Swedish nation, none is permeated by the conviction: "The forests are our strength."

How is it with us, in the U. S. A.? Are the forests our strength, our strong point? Oh, no! The forests are and forestry is, our weak point. And we are not alone in this weakness. We are sharing it with England and with France and with Italy. Germany even, with its well-arranged forestry, is far from claiming and proclaiming: "The forests—Germany's strength."

Must we say—or how long must we say—in the U. S. A.: "The forests—America's weakness?"

In Sweden, all is different. What would Swedish farming do if its manpower were not employed, on 200 winter days, in the Swedish woods? What Swedish cattle, if it were not fed, on 165 summer days, in Swedish woods? What Swedish steamers if they were not supplied with freights originating in the woods? What Swedish industries making char-coaliron, making pulp, making matches, making furniture if there were no Swedish woods?

In this connection, there is a queer observation to be recorded: If you travel through Sweden, by boat, by train or by car, you will not find any real trees; you will see thickets and you will pass polewoods; but you will look in vain for trees two feet through or more. To say it more concisely: In America, trees are sticks from two feet up; in Sweden, trees are sticks from two feet down.

There is in Sweden but one single stand, some 50 acres in size, in which are found per acre as many as 40,000 feet bm.; it contains per acre, 160 pines averaging 16 inches dbh., and 180 spruces averaging 10 inches dbh. That stand, at Katharineholm, is the wonder-stand of Sweden. Indeed, an American coast-lumberman returning from a tour through Sweden has told me, shrugging his shoulders, "that he had not seen any forests in Sweden whatsoever." He would not get a dollar's worth of lumber from the best stand in Sweden if it were transferred to Washington, to Oregon, or to California.

There is another unique feature of Swedish forestry: There are but three species—one yellow pine, one spruce and one birch. That is all.

Thirdly—ask me to name the most important forest product of Sweden and my answer is: "Fuelwood!" Sweden, having no coal, is living by fuelwood; its industries are using fuelwood or charcoal. Indeed, many of the railroads are using fuelwood—coal is too expensive!

If there were coal in Sweden, and if there were established in Sweden that devilish industrialism which is fed on coal, how could the Swedes proudly proclaim: "The forests—Sweden's strength!"

Who are the owners of the Swedish woods?

Half of them consist of farmers' woodlots; one-fourth is owned by forest companies; the remaining one-fourth is owned by the state. Communal forests are unimportant.

The state controls what no private party was willing to own. As late as the middle of the last century, Swedish state-forestry consisted in the sale of forest lands. As a consequence, the state forests comprise the most worthless and the most remote parts of Sweden. They prevail, notably, in the icy north; and the average annual net yield per acre is no more than 20 cents. A national forest comprises, in the north of Sweden, as many as 500,000 acres; in the south as few as 10,000 acres. Forestry is a problem of transportation; it can and it should become, also, a problem of silviculture; transportation is, however, foremost—the Swedish forester is a logger and he must be a logger.

In Sweden, the chief problems of transportation are already solved. From November 1 to March 31, there is a solid crust of ice and snow all over the Swedish woods. No steel rail is needed and no tractors—a single pony is hitched to a sled—there are thousands of farmers' sleds engaged in the work—and the loaded sled is steered by the pony, always down-hill, to the nearest creek or to the nearest lakelet. Gravity is the ever-present and is the cheap motive power universally employed, in the woods of Sweden as in the rest of Europe. The sled load is deposited on creek or lake. When the ice and when the snow melts, punctually on April first, the logs are driven down the stream. The water is high, all summer long, due to the slowly progressing thaw-ups typical for Sweden. The creek-courses have been straightened by the foresters, years ago; waterfalls were and are changed into timber chutes or into short flumes; all is automatic until the tail-end of the drive is picked up by a crew of boatsmen, and it never happens that a drive fails to arrive at the mouth of a stream, in short order.

Again, as regards its streams, Sweden is in luck; there are many of them, parallel one to another, in lieu of one great Mississippi. Each one is deeply carved into soil and rock; none is flooding its banks, and no logs are thus lost. Once in the water, the log is *sure* to arrive at the mill, within three months. And —the sawmill is situated within the mouth of the stream which is, invariably, an ocean-harbor! Here are the sorting booms, here are the industrial establishments, here are the cities of Sweden! And from here are shipped, all over the world, the lumber and the pulp and the newsprint produced in Sweden.

Compare the ease of Swedish forest-transportation with the difficulties which we meet in the U. S. A., and you may come to two conclusions:

1. "Logging facilities—Sweden's strength!" Woods without logging facilities *cannot* constitute any country's strength.

2. The countries most backward in facilities for forest transportation are Russia and are the U. S. A.

This may be sad, it is also true. A scheme of utilizing the streams draining the Rockies for transportation, in some novel way, has not been invented. No one of us seems to have any vision or any imagination of such a scheme. We wait for time and for others to solve our chief forest-problem—the problem of transportation. Foresters have no initiative.

But let us return from America to the Swedish woods!

Many of the Swedish pulp and lumber companies are stock companies; many of the stock companies own stumpage; and many of the many are paying to their share-holders an annual dividend of 6 to 10 per cent. And here the question arises: Does the Swedish forest yield a dividend of 6 to 10 per cent? Assuming that the expenses of forestry comprise one-half of the gross returns, the gross returns on the timber investment must be expected, in that case, to be 12 to 20 per cent of the investments.

Let us see whether such returns are possible:

The Swedish stumpage, both small and large, averages 1120 cubic feet per acre. The annual growth averages 28 cubic feet per acre. The ratio, then, cannot amount to more than 2.5 per cent. How can an industry pay dividends of 6 to 10 per cent from gross returns amounting to 2.5 per cent?

The facts are these: The Swedish industries have invested in stumpage no more than a fraction of their capital. They obtain from their own woods a fraction of their raw material. Their woods are a sort of a reserve. Their industrial supplies come from the farmers' woodlots—which they control by their control of the logging facilities—and from the state forests.

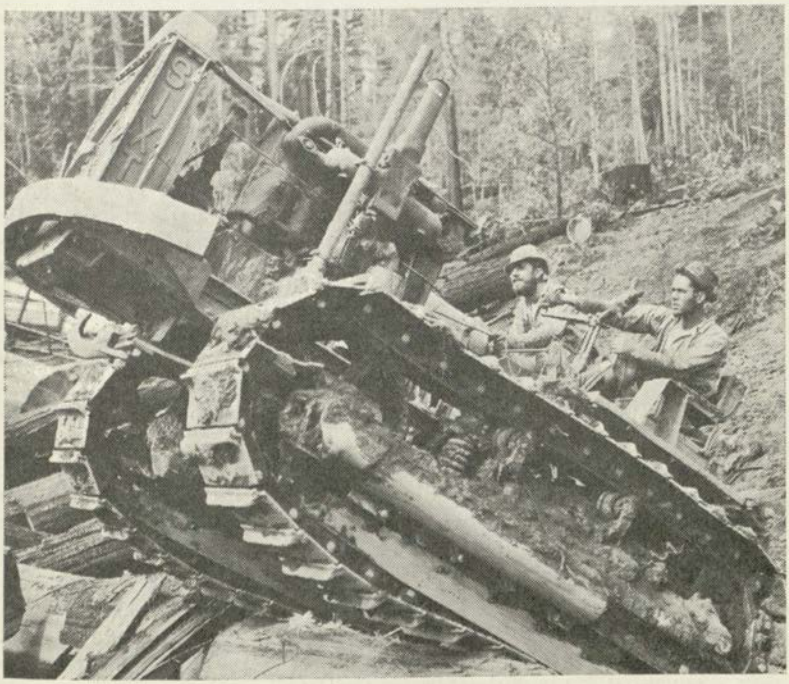
As regards Swedish silviculture, there is no regularity about it. On the whole, a second growth is obtained by natural seeding. The visitor is shown strip fellings, selection fellings, group fellings, shelterwoods, and what not; experiments everywhere; certainly nowhere; exactly as he would find conditions to be in France, in Germany and in the rest. There is one striking Swedish regulation: All tree seeds used for planting must come from mother-trees standing nearby. They must be picked from the proper indigenous *tree race*.

Of the three Swedish species, the pine was and the spruce is becoming the most valuable. Fortunately for Sweden, the spruce is gaining ground in the woods, too; it forms an understory beneath the pine and it shoots ahead when the pine is cut. In 50 years the Swedish slogan may read: "The spruce—Sweden's strength." While there is, all over the world, a decided deficit of spruce, this species is on the increase in the northwoods of Sweden. And our rayon silk and our rayon cotton may have to come from Sweden, from the year 1979 on.

In Sweden, there are three kinds of foresters, none claiming to be scientific, all practical: State foresters in charge of all logging operations in state forests; private foresters in charge of

all logging operations in the forests controlled by the industries; finally, county foresters co-operating with the county officials in the management of the woodlots privately owned. The number of foresters trained at Stockholm, in the technical school of forestry, and employed in the woods, approximates 250. Each one has charge of a distinct district. All of them are capital fellows; many of them were in attendance on October 15, at the Stockholm festival. Wherever you meet a Swedish forester, in the ball-room or in the woods, you will be surprised by his gentlemanly behavior, his thorough knowledge of the world at large, and by his enthusiastic devotion to his profession. Indeed, having meet a number of these Swedish foresters, I am tempted to paraphrase the Swedish slogan by proclaiming:

"Sweden's strength—its foresters!"



This is a sister to the "Sixty Caterpillar" that is known as Paul's New Ox and is part of the Forest School equipment.

A FORESTER GOES TO THE DOGS

Guild, Idaho
February 16, 1929

Dear K:

This forestry business is a great life; one can never tell where the next move will land him.

Last spring the Dean and Professor Clark said timber sale work in D.4. so we packed up and were on our way. April twenty-first we landed here on four feet of snow, and now—eight months later—we have fifty-five inches, (not including any we may have lost from thaws) and prospects are good for more.

Everyone said, "Guild is a wonderful place in the summer time after the mosquitoes leave." Now we are able to see why the late summer season is so greatly appreciated. The Yellowstone National Park is open also during the summer, and we have six daily trains passing about two hundred feet from the house, and about midway between the track and the house is the Big Springs loop of the Yellowstone Highway, so we see lots of fishermen, tourists, and pleasure seekers. By December first the last train pulls out and that means the last until some time in March, when the rotary comes up. This leaves us fifty miles from the nearest town of any consequence, with fine rail connections but no trains.

By the first of the year there is usually four feet of snow and should one try to venture off the beaten trails it spells disaster, unless of course the adventurer is shod with webs or skis. One winter, which was an exceptionally hard one, they had ten feet of snow—we hope that doesn't happen again this year.

From the depth of snow we have, it is easy to see that horses are of little value if one must leave the traveled roads; hence, we use snow shoes, skis, and dogs. Before we arrived here I thought that dog teams and dog races belonged "up north" but I was mistaken.

Election day I saw my first dog team in action. One of the local men came seven miles with his dogs to cast his vote for Hoover. Since that time we all use them for going any distance.

This business of driving a dog team sounds easy, but when one stands on a pair of skis behind four to seven dogs with only a tow line to hang to, it is different. Now when traveling is confined to roads, the dogs are hooked tandem (one ahead of the other) and the only means of guiding the team is with the lead dog. He must know his "Gees" and "Haws".

The leader is usually the pet, as one must naturally work more with him to train him properly. Then too, old hands at the game say that the other dogs are jealous and try to catch the leader.

Sharp turns in the road are some times almost fatal, when trying to make them on skis. Professor Cook talks of the "Ham-

mer Method" used on curves, but I think he must have another idea. Of course his is surveying and not dogs.

If the dogs are working good and are well trained, it is a pleasure to use them, but if they aren't, I'll put them in the same class with mules. I find that mine seem to like to work better when headed for home, and the fact is, when the going is good, I make it home from a camp three miles away in eleven minutes; that is, on skis. It takes a few minutes longer with the sled.

Frequently on these ski trips home if one fails to make a curve, and doesn't have the tow line fastened to a belt; after he gets up, shakes the snow out of his shirt sleeves, finds his skis, his lot is to travel home by hand, for the dogs are deaf to all commands of Whoa on the homeward journey.

There is one advantage to dogs. Upon arrival at the place or scene of action, the dogs are unharnessed and they follow along behind, so of course there is no hunting them when the time comes to move on.

Most of the teams around here are made up of just "dogs"; all kinds of crosses and mixtures. Our team has been collected one at a time through the summer. Out of the five of them, two are pure bred Llewellyn setters, and the other three are of unknown lineage. We were very fortunate in making our collection, as we had only one out of the lot to break. The lead dog had been in the Ashton race last year—so I was spared the trouble of breaking him. Three will pull a man on skis for short trips, but on a long trip it is very tiresome standing in the same position so long, so five dogs are used with a sled.

By the middle of February there is a very firm crust on the snow, and it usually stays until near the end of March. During this time working with the dogs is more pleasure than labor. The dogs seem to enjoy the work, especially on moonlight nights.

Speaking of night work, I must tell you of one tough one we just experienced. The Ranger under whom I am working has been sick ever since he came in on the 10th of January. Night before last he had a pretty hard time of it, so we went up and moved him and his wife out. I pulled him on my sled with three dogs (the other one having cut a toe off the fore part of the week while helping me inspect a tie hacks strip, he stepped on an axe). Well, we had a tough trip. Leo, the Ranger, had a bladder stone and could not sit up, so I had to load him on the front of the sled, and that made it hard to steer. Fact is, I had to ride too in order to keep the rig on the trail. It took about an hour to make a little better than two miles, and it was work all the way. When we had moved them down here we brought him in and give him a few minutes to rest before he started in the horse sled which was waiting. They left about 2:15 A. M. and were three and one-half hours making four miles, when their team gave out. A change of horses was made, and they went

Most of the teams are made up of just "dogs."

on down to where the stage was waiting. They were six and one-half hours on the road to the stage station, a distance of 13 miles.

Dogs have their uses other than chasing cats and getting stuck up with porcupine quills, and I, for one, will recommend them to foresters who are in a "big" snow country.

Very truly yours,

Merle Markham.

TRIALS OF A SMOKE CHASER

By James Clark, Clearwater National Forest

The Smokechaser picked up his axe and shovel, wriggled into his heavy packsack and started for the fire.

"These tourists are certainly careless," he remarked as he emptied his pipe on the dry pine needles.

He stepped out and forth. Presently, climbing over a steep granite ledge he reached a high plateau.

The berry bushes thereon bent to the ground with their load. "Minutes count," he observed, as he stopped and ate his fill.

A grouse whirred upward and settled heavily on a low pine. "They will be scarce after the season opens," he murmured. Then, drawing his revolver, he fired, neatly clipping off the bird's head.

The sun sank behind the trees and the shadows grew longer. The smokechaser made camp, cooked his grouse, and lying under the boughs of an ancient fir, he slept.

ONE HUNDRED AND FIVE MILES OF RAPIDS

Reprinted from American Forests and Forest Life, the Magazine of the American Forestry Association

By J. B. Halm

It was all settled. I was to run a survey for the United States Forest Service, down the canyon of the North Fork of the Clearwater from the Orogrande to Isabella Creek. The turbulent waters of the North Fork find their source in the Bitter Root mountains, between Montana and Idaho, and flow southwesterly across the entire state of Idaho through Asahka to Lewiston, ten thousand feet below their source, where they join the Snake River, a tributary of the Columbia. The entire drainage of the North Fork is through rough, mountainous territory, densely timbered with pine and fir, and few, save the occasional prospector or trapper, had ventured into this wild and almost trailless region. Our survey was to be for a trail, the preliminary of a future road between the Orogrande and Asahka.

Two weeks later, Claud, Bill and I found ourselves alighting from the train at Orofino. Claud and Bill were university students, out for the summer and incidentally after field experience. Bill was an eastern lad, inexperienced in the ways of the woods but willing to learn. Claud was a good-natured western boy, keen and quick,—a wonderful combination of mental and physical ability, which three years later won him a place as captain of the West Point Football team.

At Orofino, we outfitted with supplies and equipment for three months and the next day were loaded on top of our equipment behind two teams en route overland on our sixty-mile trip to the North Fork. We arrived at the old placer mining town of Pierce City, thirty miles out, just before dark. As we picked our way along the deserted street later that evening, the old log buildings, mostly vacant and crumbling to decay, which had stood since the gold rush in the early 60's, gave us a queer feeling of awe. The old Chinese cook who prepared our supper in the only hotel of the town, had come, so we were told, with the tide of gold seekers in the early days, and, like a piece of drift, had remained stranded after the tide moved on. Of the hundreds of Chinese who followed the early gold rush, he alone remained.

At dawn the next morning we were off. Sixteen miles farther on we reached the end of the wagon road. Pack horses took our outfit the remaining twelve miles down Orogrande Creek into the canyon of the North Fork to the "Bungalow," the end of the trail. The "Bungalow," located on a little bench at the confluence of Orogrande Creek and the North Fork, was merely an old log cabin with a large stone fireplace. It had, in all probability, been dubbed the "Bungalow" by some of the fishermen or hunters who had frequented this out-of-the-way

place, or by the crew which had constructed the cable bridge across the river the preceding summer.

Frank, an old experienced riverman who was to act as our cook and boatman, had gone on a few days ahead to start the construction of our boat. He was overjoyed upon our arrival. He had caught several large trout which were on our menu for supper that night.

The week following was spent in felling trees, whip-sawing lumber and building an eighteen-foot bateau, a boat such as rivermen use, made to stand rough water. A raft of cedar logs, six feet wide and twenty-six feet long, was also made. This raft was withed together with wild cherry and had a deck in the center built up above the logs. On this deck we lashed our cargo. Large sweeps were balanced on headblocks on each end. This raft and boat were to be our mode of travel down the canyon.

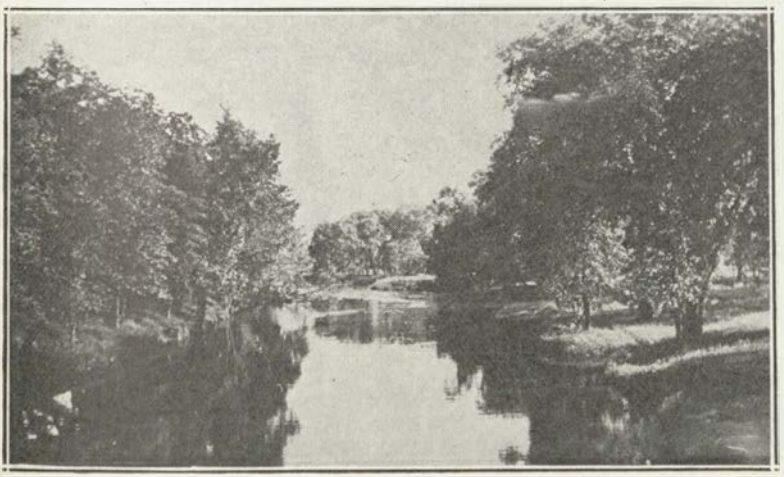
June is always a pleasant month in the mountains, but a blaze in the old fireplace was very welcome evenings as we sat Indian fashion around the hearth swapping yarns and singing old songs to the accompaniment of Bill's ukelele.

When our survey had been extended several miles, we made our first move. I had never run a river raft before and my experience with a bateau was limited to slow water. Although those first three miles of rapids were tame compared with what we encountered later, I shall never forget the thrill of that first ride. Our boat had been carefully loaded and covered, and I was instructed to stand in the bow and paddle straight ahead. At the word from Frank, I was to paddle hard, right or left. We pushed into the current. Standing awkwardly in the bow, I felt quite useless, but paddled as best I could. At the first white water, Frank called "Right!" Before I could respond, the boat lurched and I was on my knees in the bottom. The dangerous rock slipped by without touching us.

I glanced back at old Frank. His face was expressionless, as I found it always was when running rapids. With knee braced against the side of the boat, his keen eye on the spray and rocks ahead, his paddle skilfully guided the boat through to safety. I shall always feel that the safe and successful outcome of our entire trip that summer was due to the cool judgment and skilful paddle of our old boatman. We landed safely in an eddy just above Castle Rapids, as we later named them, where the river roared and tumbed over gigantic boulders.

Running the raft was much simpler than the boat, as the river was still swollen and few hidden rocks were encountered. We made camp in a beautiful spot on a tiny bench above the beach. As there was no trail back, and an almost impassable canyon ahead, we were now isolated from the outside world. The fir clad canyon with its steep and often perpendicular walls is one

(Continued on Page 72)



There are numerous sloughs and some thirty or forty species of hardwood trees on the area.

THE UPPER MISSISSIPPI RIVER WILD LIFE AND FISH REFUGE

By Harold W. Hicks, Junior Forester, U. S. Bureau of Biological Survey

About five years ago, to be exact, on June 7, 1924, Congress passed an act for the establishment of the Upper Mississippi River Wild Life and Fish Refuge. The principal part of the act reads that "Such areas of land, or of land and water situated between Rock Island, Illinois, and Wabasha, Minnesota, on either side of or upon islands in the Mississippi River which are subject to overflow by such river and which are not used for agricultural purposes" are to be included within this Refuge.

The Refuge is controlled jointly by the Bureau of Biological Survey, of the U. S. Department of Agriculture, with Mr. Paul G. Redington as its chief, and the Bureau of Fisheries of the U. S. Department of Commerce, with Mr. Henry C. O'Malley as Commissioner. The area is approximately 300 miles long and averages about one and one-half miles in width. It borders the four states of Minnesota, Wisconsin, Illinois and Iowa, and contains approximately 250,000 acres of land and water.

Headquarters were established at Winona, Minnesota, a city of 25,000 people, located on the Mississippi River, about 40 miles south of the north end of the Preserve. Mr. Wm. T. Cox, formerly State Forester of Minnesota, was made superintendent, while Mr. Rudolph Dieffenbach, formerly of the United States Forest Service, was made assistant, in charge of land acquisition.

The first problem, that of making a type map of the area, was something most foresters had not yet met with, because most of the land was low and marshy and under water from a few

Black Bass
A product of the waters of the Refuge.

weeks to six months of the year. But it had to be typed, and tactics different from those employed in mapping the National Forests were necessary.

A two-cabin cruiser, *The Widgeon*, which had formerly been used in game law enforcement work on the Illinois River, but which at this time was lying idle on account of the condition of its engine, was acquired. The boat, which was equipped to accommodate six men, was brought from Peoria, Illinois, up the Mississippi to Winona. It was soon overhauled and put into service as the base of mapping operations. This was in July, 1926.

With the aid of railroad maps, U. S. General Land Office maps, and those of the Mississippi River Commission, we set out to map the Refuge. Base lines were run east and west or north and south, as conditions permitted, from U. S. Bench Marks, railroad bridges, government river lights, and from any point the location of which was certain. These lines were run with a transit into the lowlands as far as possible. From these base lines the area was gridironed every 20 chains and mapping done on small note-book sheets, with a scale of two inches to the mile. Distances were estimated by pacing, and bearings were run by the Forest Service compass on a Jacob staff. More than two years were necessary to complete this work, but the result was a map of the entire area, which showed the following classes of types of land: Marsh, timber, brush, hay, grazing, agricultural, abandoned farm land, sloughs, lakes and ponds; besides showing all improvements, such as cottages, fences, railroads, roads, etc.

(Continued on Page 79)

ALL IN A DAY'S WORK

By L. A. Merryfield

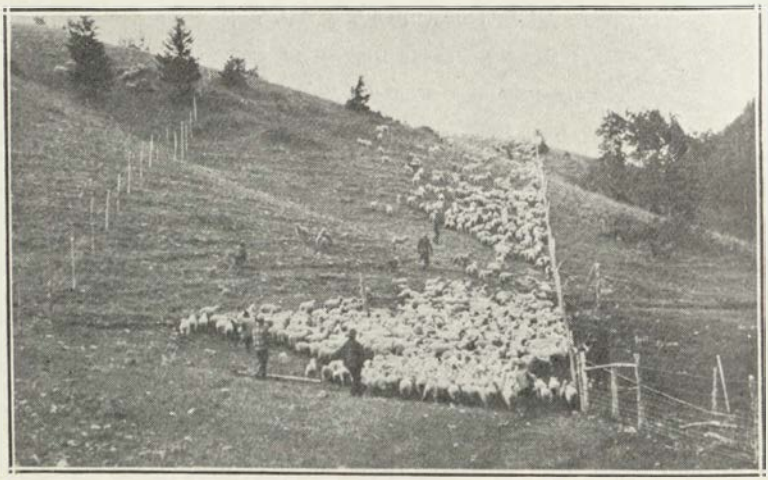
Forest Ranger, Madison National Forest

B-a-a, b-a-a, ba-a-ah, was the sweet music that awoke me from my peaceful slumbers. I turned on the flash light and found it to be 3:30 a. m., and, as I began to regain consciousness I remembered that the camp-tender had been instructed to have his band of woolies in the counting corral by 4 a. m. The bedlam of dogs barking, sheep bleating camp-tender and sheep-herders yelling indicated that they were here. I called Nelson, my able assistant, and he, about half asleep, asked me if they were wild sheep. I said no; why? Well, why do you have to sneak up on them in the dark, then, was the answer.

We went out and counted them through and now had five bands on 16 miles of driveway and three more trying to get in; all we had to do was to direct them to their proper range; keep them from mixing on the trail and stealing feed from the allotments along the driveway. After a hasty breakfast I started up the trail, leaving instructions with Nelson to count the next band through at 9 a. m. and then ride up the driveway to see that they were all moving and back to count another band in at 5 p. m. The band that was ahead was supposed to break camp at 4 a. m. and move up the Bear Creek hill, but, when I arrived on the scene, there had been no stir at the camp as yet. After getting them "out of the hay" and helping start the sheep up the hill I rode on to Polly-wog springs where the next band was camped; they were now out of sight.

I left the driveway here and rode down the Bear Creek trail. A black bear with two cubs soon appeared ahead of me. I loped up on them and the cubs took to a small fir tree. I tantalized them with a stick until the she-bear came back puffing like a locomotive. I chased her away and continued teasing the cubs—did this two or three times until I discovered she was fast losing her genial disposition so rode on.

The sheep were now moving along the driveway nicely so rode to one of the allotments to see how the new herder was getting along. I found the sheep in two or three bunches scattered over half the forest, but no herder, and by the appearance of the area very little herding had been done the past few days. He was finally located in the cook tent still in the arms of Morpheus—he came out of it with a collection of gutteral noises heard only from a Mexican sheep-herder. I then gave lengthy discourse on regulations, how to herd sheep and the value of the early morning sun for one's complexion. By the time I had reached the ninth verse I discovered that he was trying to convey the idea to me that he didn't understand English as she is spoken. This kinda took the wind out of my sails but it looked fishy to me, and on mounting my charger I remarked that I would



We had five bands on 16 miles of driveway.

have to ride to the ranch and see his boss. Lo—a miracle happened, in those few seconds a complete working knowledge of the English language came to him. I have been expecting a call to the English department of some college ever since.

There wasn't anything further to do here so rode back across the driveway to the Red Mountain allotment reading vegetative readiness plots on the way. After getting well up the mountain I decided to go to one of the higher plots and take a reading; this plot was under some 1 to 4 feet of snow which made it difficult to determine the density, species and present state of development, but, by using a combination of Clark's taper curves, Skeel's G. E. formula and Spaulding's evolution lectures, I finally arrived at a satisfactory conclusion and continued on my way.

I had no trouble locating the next herder; as soon as he saw me he came my way on the run, swinging his arms like a windmill and trying to talk and scream at the same time. I didn't know whether to run, hold my ground or shoot; by the time I had collected my few thoughts he was getting pretty close. He was shouting, bear, rocks, sheep, over and over again. The only thing I could figure out was that the bear must have been throwing rocks at his sheep. However, this wasn't the case. After he had calmed down a bit he told me he hadn't slept for two nights as the bear were thick around there and they were likely to come into his tent at any time and devour him, pants, shoes and all. He further stated that Red Mountain was falling apart and that great boulders rolled down its sides all times of the night and day, and that he could see all his sheep at all times in this rough country. We had supper and taked the matter over, and finally he saw the light and agreed to stay with the band until

I could get word to the owner. I then rode back to the Bear Creek trail towards camp and soon met Nelson on his way up the trail. He had with him a small camping outfit so he could camp on the driveway the night and be where needed early the next morning in order to get them moving as early as possible. He told me he had left the last band camped at the foot of the Bear Creek hill but they didn't look like they were going to stay camped. When I got down there their sheep were peacefully feeding on the cow range. One of the cattle permittees was also on the job and appeared to be on the war-path. He said they were dogging his cattle, stealing his feed and in general raising Cain with his cattle. His cattle, at this time, were some three miles north of the driveway. This difficulty was soon adjusted and the camp-tender instructed to get his sheep back on his own side of the drive-way; this he agreed to do stating that a Forest Ranger comes up or down this trail every half hour.

We rode on down to the station to find another band in the corral ready to be counted early the next morning.

One could only speculate what would be the happenings of the next day, but, it is certain to be both interesting and diversified.

MYSELF

"I have to live with myself and so
I want to be fit for myself to know.
I want to be able, as days go by,
Always to look myself straight in the eye;
I don't want to stand with the setting sun,
And hate myself for the things I've done.

I want to go out with my head erect;
I want to deserve all men's respect;
But here in the struggle for fame and wealth,
I want to be able to like myself;
I don't want to look at myself and know
That I'm bluster and bluff and empty show.

I never can hide myself from me,
I see what others may never see;
I know what others may never know;
I never can fool myself, and so,
Whatever happens I want to be
Self-respecting and conscious free."

SELECTED.

LETTER FROM A SHEPHERD TO HIS PAL

Tomboy Sanitarium,
August, 1928

Dearn Ern:

I wish you was here right this minute for I want to have a heart to heart pow-wow with you. This is going to be a deep subject, Ern, and I want to pay close attention. You remember Mrs. Anson Marble Farleigh, the little lady I piloted to the top of Elk Summitt? Well, Ern, there's just a whole lot more to that little dame than you'd natcherally think at first glance. When you overhear her converse lightly with the patients here about their plugged pendixes, inflamed gall bladders and floating kidneys, you get the idea that she's one of them social butterflies you read about, shallow mind and no intellectual bottom to her makeup. And that's exactly where you'd be off on the wrong trail. For when you get next to Mrs. A., and get to know her better, she gies you the surprise of your life. She's deep. Fact is, she's a studious thinker and already has solved some mighty weighty problems. And the way she can explain things is a wonder. Her pet subject is what she calls "the eternal fitness of things," and when she gets going on that theme you absorb a lot of boiled-down knowledge that gives you a broader slant on your own position in this here universe, and you begin to realize that you're here among those present maybe for some big purpose. She stirs up your ambition and you want to get out and play your part and do your share of the world's work.

That's genius, Ern, nothing else but genius. According to Mrs. A. the biggest thing in life is for a man or woman to find their true mates. That's the main mission in life. It's sinful, Mrs. A. says, for a wander to wander down through his precariously short span of existence selfishly alone, when it was all the time intended, right from the first, that he should work for and with some blond or brunette party of the opposite sex. Share his pleasures with her, and his griefs, if he has any. You begin to see what a deep thought this is don's you? It's full of alluring promises and sentiments, too. Fall down on that principle and life ain't got much in store for you. It's absolutely essential to this here plan, the way Mrs. A. unfolds same to me.

When you come to look at it you'll have to admit, Ern, that it's a wonderful scheme. Here about twenty years ago, maybe, some enterprising gent found himself a girl and they went matrimony. He hadn't the remotest idea at the time that you was then prowling around in some other nook of the land, just learning the art of walking upright, or maybe already toddling to school with your first reader under your arm. They drag along, him and her, and first thing you know they're raising a girl. That's going to be your pal, only you don't know it. They raise her, like as not

on a bottle, and by and by pay out a lot of money for her upkeep, clothes, piano lessons, and fancy sewing. Just training her for you, that's what they're doing. After a while when she gets to the paint and powder age, and weans herself from the habit of parking on grandpa's lap, you step into the picture. Compared to what her parents had to go through you've got an easy task. All you need to do is to provide a reasonable supply of candy, plenty of gas and oil, some show tickets, and a diamond ring. The whole smear won't stand you more than a couple or three hundred dollars. Her parents spent maybe six or seven thousand dollars on her, and she's got to be about the most entrancing thing that moves around without wheels, but you get her at about three cents on the dollar, a real bargain.

Funny thing was, Ern, that all the time Mrs. A. was talking to me about this here topic I had you in mind. Yes, sir, right away I got a picture of you, drifting along your lonely way through life, with nothing to look forward to but the Fourth of July and Xmas to give you variety, and I said to myself that the time had come for you to make a change. Then, by what you call a coincidence, Mrs. A. outlined the kind of man she'd have in mind if she was to make another try for a husband. And Ern, she couldn't have described you any better if she'd knowed you since you quit wearing shot dresses. And I'm here to tell you, Ern, that you'd be mighty lucky if you can throw your string on this little lady. She's got oodles of money, but you just forget about that. It hasn't spoiled her one bit. And you, on your part, why she'd have to hunt the world over to find a man more suited to her ideals. In the first place, you're practically virgin material for a matrimonial venture. As far as I know you've never even been in love. Mrs. A. will just be tickled pink to meet you, I know. She's plumb tired of what she calls sophisticated men, and whatever that means, I know you don't belong in that class.

So I want you to send me one of your pictures, and I'll start the ball rolling for you. There's nothing like having somebody boost your stock for you in a deal like this, and I'll tend to that proper. Have yourself a suit of clothes made, something that costs around sixty-five to seventy dollars. And get yourself a different kind of hat. Do away with that ten gallon style you've been wearing all these years. Maybe you'd better wait with the picture till you get that outfit and then have it taken in the new environment. Then you might get you a book on ettikett. That's one item you don't want to overlook. And read it too. Fact is, it wouldn't be a bad idea if you was to go to town and stay a week or two and pick up with a stenographer, or a waitress. Better tackle a waitress, Ern, for you wouldn't have much in common with a stenographer. There wouldn't be anything you could converse about. With a waitress you can talk about food and have ground to work on with which you'd both be familiar. There's a

lot of little items you've got to attend. You've got to get broke to the smell of perfume, for instance, and a lot of things like that. Then when you feel a little more sure of yourself I'll arrange for a meeting with Mrs. A.

In the meantime, Ern, I want you to write her some letters. Something to break the ice, so you won't bust into her realm of consciousness too sudden. I'll censor your mail personally and see to it that you keep in line with her woman's sense of intuition. You don't know what that means, but don't bother, I'll take care of everything.

Your friend and pal,

Richard A. Wormwood.

A TOUCH OF HUMOR

In *The Scientific Monthly* P. J. Searles writes about "The World's Most valuable Tree"—the coconut tree. It furnishes timber for building, thatching for roofs, fiber for baskets and even material for clothing, food, and drink.

It is an industrious tree, especially in the production of sap. This begins fermenting as soon as it leaves the tree, with about five or six per cent of alcohol as a "starter." From the sap the most famous drink in the Orient—"arrack" or "toddy"—is distilled.

Concerning this drink Mr. Searles quotes from the journal of William Damphier, the old pirate, in evidence that even in the time of Robinson Crusoe toddy and arrack were well known:

There is also a sort of Wine drawn from the Tree called Toddy. Those that have a great many Trees, draw a spirit from the Sowre Wine called Arack. Arack is distilled also from rice and other things in the East-Indies; but none is so much esteemed for making Punch as this sort, made of Toddy or the sap of the Coconut Tree, for it makes a most delicious Punch; but it must have a dash of Brandy to hearten it, because this Arack is not strong enough to make good Punch itself.

Mr. Searles adds: "The above extract is from an account of the Island of Guam. This island, now in the possession of the United States, is prohibition dry, but the process of manufacturing arrack is so simple and speedy that it is difficult to make the coconut tree obey the law."

SELECTED.

HISTORIC LANDMARK OF UNIVERSITY DESTROYED

Forest Lookout at the Top of Mt. Sentinel Burned by Unknown Persons

As Related by Dorr Skeels, Professor of Forestry and Director of the State Forest Nursery.

The Old Lookout

The autographs of hundreds of former students of the University were erased a few months ago when the forest lookout, which has stood at the top of Mt. Sentinel for fifteen years, was burned. Almost every student in the university since 1915 when the lookout was built has climbed the mountain at least once to survey from this commanding point the surrounding country and, perhaps, carve initials some place on the octagonal structure. Because of the difficulty of construction on the mountain summit and the decline of hiking as a student recreation, it is not probable that the lookout will be replaced.

Forest School Project.

The regular four-year course of the School of Forestry was established in the fall of 1914, and in the fall and spring of 1915 the trail up Mt. Sentinel was constructed with student labor The lookout was built in the fall and winter of 1915 for purposes of instruction for forestry students in the methods of detecting forest fires as well as for a rest station for hikers. The trail begins beside Dornblaser field and zig-zags up the mountain for 2000 feet above the level of the steps of Main Hall. The lookout was built like a block house with a second story containing windows on all eight sides.

Spare cash was not so plentiful with the students of the State University in those days, and little difficulty was experienced in securing the necessary labor for the construction work at the rate of 20c an hour. This was in the football days of Click Clark, Vance, and Big Bentz, and the earnings from labor on the forest trail were of considerable assistance to many members of the winning football team of 1915.

Popular in the Old Days.

The University community lost little time in taking advantage of the recreational advantages of the trail and rest station on Mt. Sentinel. In those days before the common use of the automobile hiking had not lost its place as a popular sport. On a pleasant Saturday or Sunday afternoon it was not unusual to see a hundred students strung along the trail or grouped in pleasant spots on the side of the mountain. And it was quite

the thing in those days of long skirts and tight-fitting trousers for parties to hike up the mountain in the evening and have a beefsteak or weenie roast on the summit near the lookout.

The old trail is still a great boon to the freshmen when they climb the mountain each fall and spring to "paint the M." Some of the more vigirous spirit climb straight up the mountain, but the long lines of new students in the fall packing lime and water up the steep slopes find the trail indispensable. Shortly before reaching the "M" the trail passes an old prospect hole. Above the "M" where the trail turns there is an excellent view of Hellgate canyon.

However, the popularity of the trail and station for parties of hikers have waned in the last few years so that the burning of the lookout will not be greatly missed by the present or future students, and even the old grads who return at Homecoming have lost the desire to climb the trail and watch the changing colors on the nearby Mission, Missoula, Flathead, Sapphire, Swan and Garnet mountain ranges. But the summer school students, largely school teachers from the East and the Middle West, will miss the picturesque lookout.

THE CASTAWAY CANOE

Oh, the fur fleets sing on Temiskaming
As the ashen paddles bend;
And the crews carouse at Rupert's House
At the sullen winter's end.
But my days are done where the lean wolves run,
And I ripple no more the path
Where the gray geese race 'cross the red moon's face,
From the white wind's Arctic wrath.

My seams gape wide and I'm cast aside
To rot on a lonely shore;
While the leaves and mould like a shroud enfold—
For the last of my trails are o'er.
But I float in dreams on Northland streams
That never again I'll see;
As I lie on the marge of the old Portage
With rushes for company.

ANON.

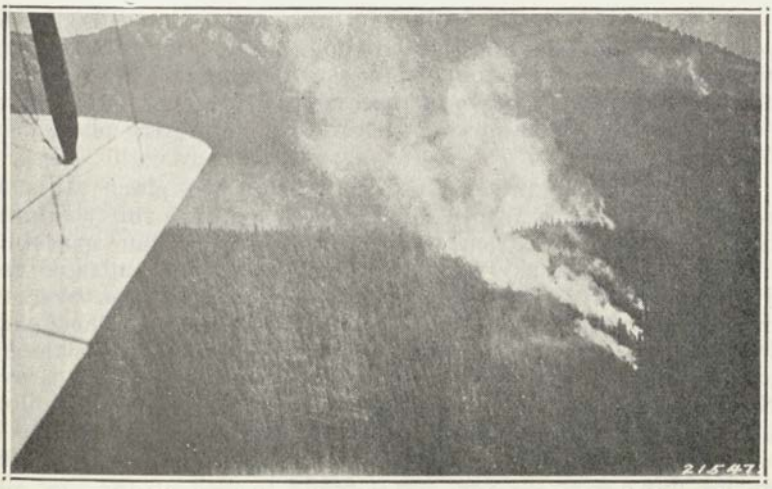


Photo Courtesy U. S. Forest Service

Within a few minutes the plane circles over the smoke.

A DAY WITH THE FOREST SERVICE AIR PATROL

By Jack Jost

The airplane patrol in District One for the past four seasons covered approximately fifteen million acres. The patrol covered the area from the continental divide in Montana westward to eastern Washington and from the Canadian border southward to central Idaho. Contrary to general opinion no regular patrols are made, instead two planes are held at the base headquarters located in Spokane, Washington, and only leave on patrol when called for some specific purpose. This method has proved its efficiency over the regular patrol, which was used in California during the seasons of 1922 and 1923.

There are two main purposes for the patrol: namely, to provide for protection in addition to that given by the regular ground organization; and to provide topographic maps for unsurveyed areas. Fire detection is the most important purpose of the patrol, therefor, all fire calls have preference over all other requests for planes.

Planes held at Spokane airport are always ready for instant use. Requests for ships come from the District Forester or Forest Supervisor's office. The office placing the call gives the observer all the information relative to the comparative location of the drainage or fire. This information is placed on maps that are specially prepared from the best map data the Forest Service can obtain. They are generally on a scale of one-quarter inch to the mile and are mounted on pieces of beaver

board about 15 by 20 inches for convenient handling in the plane's cockpit. In addition to topography, roads, towns, etc., the maps show all lookout cabins, smoke chasers' headquarters, and ranger stations. Two of these maps are placed in the plane, one for the pilot and one for the observer before the plane takes off on its mission.

Generally the interval of time before the plane takes off ranges from ten to fifteen minutes. Never over thirty minutes is necessary. With a roar of 420 iron horses the plane gracefully climbs up into the sky winging its way to the fire infested area 100 miles away. The pilot and observer have been over the country so often that no trouble is found in keeping their exact location. Valleys stretch their rolling terrains as far as the eye can see. Forty minutes have thus passed and the plane is over the forest. There are no landing fields here and all the pilot's and observer's hopes are placed in the fiery monster fighting its way through the air. Both the pilot and observer are ever alert gazing down over the vast forest ready to pick up the first sign of smoke. Up ahead looms the objective. Due to the rough topography and the high mountain peaks only the mouth of the drainage can be seen. Within a few minutes the plane pushes its nose over the towering peaks. Up ahead about three miles a smoke is seen. It languidly ascends into the air, finally disappearing as it merges with the horizon. Within a few minutes the plane circles over the smoke. The fire looks like not more than a few acres but the observer is not fooled. He knows that there is grave danger of under-estimating the fire's size. The observer immediately checks off the location of the blaze on his map by counting the drainages from some known point, such as a ridge, or stream. He finds it is quite a job to look at the map and the ground at the same time, but from experience he has learned to accomplish this very quickly. When he finds the creek on the map he estimates the distance from the creek to the fire. If he is not sure of his bearings he requests the pilot to go down the stream to some easily seen point that can readily be located on the map. Within a few minutes he sees a road crossing the creek, checks its location on the map and signals for the pilot to return to the fire. The pilot does not follow up the creek bottom but along one side of the drainage so the observer can see the creek and all of the topographic features. As they return up the drainage the observer checks off the small creeks and draws on his map as they pass over them until he reaches the fire. He finds that he checks with his first location so he knows that he has the correct location of the fire. With this location determined he asks the pilot to drop the plane. They drop lower and lower until only about 500 to 1000 feet over the blaze. This is quite dangerous but it is necessary for from this low altitude the observer obtains all of the details such as the size, kind of material in which fire is spreading, topographic features as rock slides, steep slopes, old burns, and whether the fire is in a dan-

gerous location for spreading rapidly. All of this data is being written down in triplicate copies. Everything that will be of value to the ranger in its suppression is written out. The observer leaves nothing to chance. He remembers that he is the eyes of the ranger and he must get over to him exactly what he observes, otherwise complications might enter that would allow the fire to get away. After getting all the information that is available the observer directs the pilot to the nearest lookout station. The pilot cannot see the lookout cabin but he knows by his map that it is 5 miles due east but hidden from view by the mountain peaks. From the time the plane starts away from the fire the observer is checking up on his notes. After going over them carefully and finding them O. K. he places a copy in a message dropper, which is a canvas bag filled with 4 pounds of sand sewed into its bottom and having attached to it a five-foot streamer. The streamer is necessary so that the ground crew can easily locate it after it has fallen to the earth.

The plane soon reaches the lookout house. The lookout and fireman are already out awaiting the plane for they can hear it long before they can see it. The observer motions for the pilot to circle low over the station for here is where accuracy counts. An error on the observer's part may send the message 3000 feet below the lookout and it would take several hours of valuable time to find the message in the brush. With a sign of the hand he motions O. K. and the pilot zooms the ship's nose downward until it looks like he is going to take the very roof off the lookout tower. Just at the proper moment the observer throws the dropper earthward. It descends to the ground at a distance of about 100 feet from the cabin. The pilot then turns the ship's nose skyward until the plane is back to a safe flying altitude, and circling the lookout once or twice to see that the message was received, waves a farewell to the lookout and heads back to the Spokane headquarters, knowing that the next time they fly over this area Mr. Fire will be no more.

LONGING

Oh! Take me back over life's stormy way
To a spot beyond the plain,
To a place over there on the mountainside,
That I may be happy again;
To feel the soft earth beneath my feet
And the camp fire's glow at night;
Where I can hear the bobcats hiss,
Or the coyotes snarl and fight.

Forever to leave the cities behind,
With their canyons of mortar and stone,
To breathe and to drink of the water and air
That man cannot harness or own.
How I'd love to lie beneath the tall pines
And hear them sigh again,
Or sit in the cabin, a log on the fire,
And hark to the patter of rain;

To list' to the bawl of a bear once more,
As she calls to her young in the brush,
Or to hear the fierce scream of a lion up there
As he leaps on a prey that he'd hush;
To hide on the trail of the deer in a pass
To lie in wait for his meat,
Is a privilege, I say, you never can have
In an office, a city, or street.

How happy was man in his primitive days,
With his lack of knowledge, I hold,
Dame Nature most fully prepared for his wants
With never a thought of gold.
So give me a home where the wild things dwell,
Where the deer and the antelope play,
Where never you hear a discouraging word,
And the sun shines brightly all day.

PATRICK A. TERRY, *W. W. W.*
Soldiers' Home, Calif.

School  Notes

and

Doings of the Sons of Bunyan

FROM THE EDITOR'S DESK

The friendly contacts with our contributors and the splendid co-operation shown by them in giving their valuable time that we might have their articles has been a real pleasure.

To work with a man is to know him better.

Therefore, we take this opportunity to thank those in the industry and public service and the members of our Forest Club for your help with this book.

—THE EDITORS.

Montana Druids

THE MONTANA DRUIDS, HONORARY FORESTRY FRATERNITY

By H. R. Dix

The Montana Druids, the Forest School's honorary fraternity, was founded in 1924 by a few energetic and forward-looking seniors who realized the need for such an organization within the Forest School. Founded on the idea of service and closer relationship among the students, the organization has advanced by leaps and bounds to its present envious position upon the campus. With an active membership of 28, the organization as a whole has been ever willing to lend a helping hand to any activity whatsoever pertaining to the Forest School and the University at large.

A close touch is kept with alumni, through the sending out of circular letters and personal notes, and this also helps to remind the grads of their college days.

During the year 28-29 meetings were held fortnightly at the Forest School, or in the home of some member. These meetings have proved of interest to all as is evidenced by the large attendance at each. Following the business discussion, some member presented a paper pertaining to some current phase of forestry or to experiences during the summer. This program has proven quite successful.

Meeting twice each year in the "sacred meeting ground" in the woods, new members have been taken into the bonds and the spirit of the Druids is perpetuated in the Forestry School of the U. of M.

THE MONTANA FOREST CLUB

By K. D. Flock

The first Forest Club was organized in the winter of 1914-15 and it was a small affair. The first meeting was in the home of one of the instructors as were most of the meetings that followed for some time. The first group of students and professors amounted to but 20 all told but it was the nucleus of the Forest Club that today boasts of a membership of 100.

From the first the objects of the club were outlined very clearly.

These objects enumerated are about as follows:

1. To promote good fellowship and understanding among the students of the Forest School.

2. To discuss questions that are of interest to foresters best obtainable outside of the class room.

3. Last but not least, to do things by organized effort in the way of student activity that will broaden the individual and stimulate the ability to work with his fellows.

This last purpose of the club is expressed in many ways along varied channels.

The regular meetings of the club are held every second Wednesday and after the first meeting in the fall, after the boys from Honolulu have shaken hands with those from New York and Texas, the serious business begins.

The activities of the club are about as follows in their order thruout the school year. The detailed descriptions of the events will be found elsewhere in this publication.

Foresters Moonlight Hike
Fall Quarter Informal Dance
Press Club Joint Meeting
Forest School Radio Broadcasting Program over KUOM
Foresters' Ball
Spring Quarter Informal Dance for Farewell to Seniors
Annual Spring Camp
Forestry Kaimin

The two most important activities from the standpoint of the students as far as training is concerned are the Foresters' ball and the publishing of the Forestry Kaimin.

The business of putting on the ball each year entails the handling of several hundred dollars in funds, the supervising of over 200 hours of spare time work by 10 separate crews of students so aside from the pleasure afforded; the activity in itself is without a doubt a fine item in the training of a forester for his future job of getting things done in cooperation with others.

The Forestry Kaimin is the Forest club publication and as the Indian name implies it is "something to read."

This book of ours is financed by our own efforts and much business training is had by those members who work on it. It is the policy of the staff each year to have as many members as possible help in the publication of the book so we all benefit from it.

THE FORESTERS' BALL

By Floyd Phillips, '30

February 15, 1929.

"Attention!!! Know ye, hear ye, and heed ye, that on the evening of February fifteenth, in the year of our Lord, nineteen hundred and twenty-nine, from 9 p. m. until 1 a. m., the Forestry Club of the State University of Montana will hold its annual Foresters' Ball.

A telegram from Paul Bunyan states that he has left his home in the "VAST FOREST" and with his "OLD BLUE OX" is headed for the ball. He promises that his presence will make this year's Foresters' Ball—

A RED HOT PARTY."

Thus read the heading on the ten by twenty inch ticket for this year's party in honor of that greatest of all loggers, Paul Bunyan. And true to Paul's promise, it was! It goes down in the history of the Forestry Club as one of the greatest of all its annual "brawls."

Old Man Winter seemed determined to place every obstacle in his power in the way of the Bunyanites. Deep snow and sub-zero temperatures made it almost impossible to get the trees and boughs for the decorations out of the hills. (Ask Jim Stephenson if it was cold. His foot knows!) Weeks before the ball Professor Fay Clark and Chet Jackson, head of the bough committee, took to their skiis and traveled the hills of Pattee canyon, the Forest School's laboratory, in search of the best material to be cut. Areas were selected for improvement cuttings in the second growth stands. Many Saturdays and Sundays Chief Push Dix battled the drifts, with the big truck, hauling loggers up to the woods and trees back to the campus. Jack Jost also put in a full day with a big GMC, making three trips loaded high. Agile (?) skiimen climbed the hills to where the axemen, under the leadership of Jess Fox, were making the cuttings, shouldered the trees, and brought them flying down to the trucks on the road. Hundreds of Douglas fir trees and many boughs were unloaded at the Gym to await the day of decorating. Hot soup and coffee helped wash down the lumberjacks' frozen sandwiches at noon.

Jack Jost and Leavitt, in charge of decorating, started their preliminary work several days before the ball. On Friday all Forest School classes were excused, and all men turned out to trim the Gym into a forest. Trees surrounded the big floor, while overhead a stout network of wires held trees and boughs until the roof was lost to view from below. Lights were shaded and dimmed. At the east end of the hall a huge eagle with outstretched wings guarded a rustic Forestry sign, while at the

west end the club's monstrous moose head looked down from among the branches. Forest scenes lined the edge of the balcony.

Carl Walker and his husky assistants erected the elevated "orchestra pit" of yellow pine logs, screened with boughs. The stand was erected at the center of the north side of the floor, and the music was plainly heard from all parts of the large floor.

Hugh Redding and "Tex" Rudolph with their helpers, converted the boxing and wrestling room into the "Ranger's Dream," a paradise of dim lights, shady trees, tinkling, mossy stoned waterfalls, cozy seats, and needle-carpeted floors. As the ticket suggested, many "romantic appetites were appeased" in this retreat.

Gordon Cornell and his corps of "rumhounds" created the "Diamond Dot" saloon, a typical western barroom with its long bar, its round iron tables and chairs, its beautiful(?) pictures, and saw-dust covered floor. Cider and root beer were dispensed to the thirsty in whisky glasses and "schooners" by the "barkeeps." The barroom was continuously in the limelight during the evening, as many pictures were taken of the typical western characters there.

"Swede" Carlson and Bill Brown with their army of flunkies labored long and earnestly at their task of preparing the "eats" for a thousand hungry revelers. "Evil" Ernst and his crew converted the two large drafting rooms in the Forestry building into dining rooms with long logging camp tables. Sandwiches, cake, ice cream and coffee were served from 10 until 1 o'clock, the dancers eating in relays of 100 couples at a time.

One of Chief Push Dix's big surprises of the ball was the colored boys' orchestra which furnished "red hot" entertainment for the diners during the evening. This is the first year that this feature has been used, and it was acclaimed a great addition to the ball.

Tom Mathews, and Joe Kische were the property men for the ball and busy men they were seeing that each and every committee had all the things they desired. The property men and their Ford truck were familiar sights on and off the campus for several days before the big night. Tom ought to know every store in town.

"K" Flock and Carl Jepson believe they could handle the finances of a second Ford Motor Co., after watching over the dollars and cents expended for the ball. "K" was literally chained to his desk for days, and he almost got writer's cramp from signing requisitions. "K" was also "walking boss," but he never walked anywhere—he ran!

Fritz and Park were in charge of tickets and programs, and right novel ones they furnished. The favors were wooden peaveys with metal points and hooks, with the programs, rolled up and stuck in the handles. Tickets were scorched on the edges, giving

preliminary warning of the party's "red hot" character. Ten "warnings" were on the tickets as to dress and conduct, signed by the Chief Push.

Elmer Luer and Andy Staat had charge of music and brought up "Mope and his boys," in their undershirts and stagged pants, to do the "fiddling."

Promptly at 9:30 the "whistle punk" pulled the cord of the big steam whistle, and the old blue ox with his sleigh load of logs travelled out on the "high lead" over the center of the dance floor, and announced that the first dance on the program, the "Management Mixer," was about to start. From then on until 1 a. m., when the twentieth "Lumberjack's Lag" said Home Sweet Home, everybody was happy.

Fred Mass and Art Fallman did the art work for the ball, and many a blue ox, winking moon, and guiding sign did they turn out. Fred put so much power into the blue ox overhead that we thought he would bust a trace any minute, and lose his load of logs.

Every western character imaginable was represented on the floor. Forty-niners, scouts, miners, gamblers, cowpunchers, lumberjacks, Indians, and all their various "wimmen" were present. The Gym was alive with the colors of the bright silk shirts and scarfs of the cowpunchers and the beaded buckskin Indian garbs.

A pleasant surprise for "Paul" on his arrival was the presentation to him by Professor Cook of the Logging Engineering Department of a brand new ox. The "ox" had just arrived at the Forest School and was placed on exhibit at the front entrance to the Gym. It was a big "sixty" caterpillar tractor, the largest made by the company.

Chief Push Howard Dix sure put on some party, and left a high mark to be aimed at at future "Foresters' Brawls."

Those in charge were: Howard Dix, Floyd Phillips, Kester Flock, Mathew, Kische, Jackson, Fox, Flock, Jepson, Jost, Leavitt, Rudolphs, Redding, Fritz, Park, Carlson, Brown, Cornell, Luer, and Staat.

Guests of Honor: Governor and Mrs. E. E. Erickson, Governor and Mrs. Gifford Pinchot, Chancellor and Mrs. M. A. Brannon, Doctor and Mrs. C. H. Clapp, Dean and Mrs. T. C. Spaulding.

FORESTERS' HIKE

By Andy

Montana Foresters start the year right! Everyone looks forward to the annual fall hike with its attendant meeting around the blazing campfire under the trees at the trail's end, for it is here more than anywhere else that that fine spirit of "camaradie" is shown that lasts throughout the year and typifies the forester on the Montana campus.

This year the weather conditions were particularly favorable, and, yes,—there *was* a moon! The fellows and their gals assembled in front of the Forestry Building where a cortege of cars awaited their transportation into the wildwoods of Pattee canyon. Promptly at 8 o'clock each car with its quota of passengers fell into line and boomed out on the Stevensville highway. A look back on the long line of headlights from the grade at the mouth of the canyon gave one the impression that a rum-runner's fleet was in action. But the road to Butte lies the other way 'round the hill—and the federal officers were not to be fooled!

Members of the committee had chosen a beautiful camp site about fifteen minutes' hike from the road, within the newly purchased timber area of the Forest School laboratory. The hike in itself was very enjoyable; it was a pretty sight to see the many advancing flashlights bobbing in and out of the trees, through whose limbs could be glimpsed every now and then the slender crescent of the moon.

A big bonfire was already blazing when the hikers emerged from the densely wooded trail into the opening under the tall yellow pines. Blankets were spread and the hikers seated themselves in a friendly circle around the cheerful blaze, and as soon as all had arrived (there *would* be some exceptions, of course!) the evening's entertainment got under way.

Introductions were first made; the faculty of the Forestry School, the Forestry Club officers, the varsity and frosh football men, and the hiking committee made their bows—as did the various entertainers during the course of the evening.

Nelson Fritz started the ball arollin' with his up-to-date version of "The Shooting of Dan McGrew"—you all know how it starts: "A bunch of the boys were whooping it up at a Kappa Sunday tea!" After shooting the dangerous Sigma Nu, "Oily" Cook raised the hairs on Faye Clark's head with his vivid, milk curdling "bare tail." This boy used to pal around with Paul Bunyan and he knows whereof he speaks! Next, Alabam Brothers, Virginny Hugus and T. T. Johnson (Tiny Tennessee) entertained the crowd with their three-cornered, lop-sided debate on "who all's state produces the biggest liahs." Before the evening was over the Tennessee product conclusively and unanimously won the laurels! But to Alabama went the honor of producing the pretty

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THE FOREST SCHOOL RIFLE CLUB

By Carl Beall

As usual the Rifle Club started off with a "Bang" shortly after the beginning of the fall quarter. At first the majority of our twenty members turned out for practice every Sunday afternoon at the R. O. T. C. gallery but soon, as in years before, ennui seemed to grip the less enthusiastic members, and the turn out fell off until about a dozen of the "die hards" were left.

The records of the past couple of years indicated that the equipment was largely to blame for the lack of interest. Our battery consisted of two antiquated, well worn, Winchester single shot muskets, using 22 shorts. They were in such poor condition that the best shots in the club could not keep inside the 8 ring. A few shots from one of those war clubs looked like a shot gun pattern at long range. Such inaccuracies from the equipment inevitably led to a disillusionment and discouragement of the shooters.

One of the members who owns a Winchester 52, which is among the finest small arms target rifles made, soon demonstrated that if some of the members or the club were to be equipped with such rifles that scores would be bettered and interest be maintained. Such an action necessitated a considerable expenditure to the individuals and to the club because the latter did not have sufficient funds to finance the outlay. So two of the members bought rifles and the club voted an assessment sufficient to insure the purchase of one rifle and a small amount of ammunition, for the government issues 22 shorts which are not suitable for use in the new rifles. In order to obtain a supply of ammunition adequate for practice an appeal was made to the Forestry Club to subsidize us to the extent of twenty bucks.

Formerly, when the two teams were equally well equipped the Foresters took the R. O. T. C. for a cleaning once every year with a regularity that was quite disconcerting to the embryo strategists. But with the advent of the superior rifle, the Springfield 22, for the R. O. T. C. and the discriminatory rules pertaining to the Bradley Trophy, the R. O. T. C. won, once by actually winning a match, twice by our forfeiture, and kept the trophy. Now be it known that the whole Forest School wanted to demonstrate to the future generals that if equipped with rifles of equal accuracy we could again defeat them. So the twenty bucks were voted and Dean Spaulding donated a rifle to help the campaign along. Thanks to the Dean. This brot the total to five good rifles.

Progress continued smoothly and improvement, tho slow, was none the less certain until preparations for the Foresters' Ball commenced. Then practice had to be discontinued for near-

(Continued on Page 71)

BROADCASTING PARTY UP PATTEE CANYON

By Andy

Radio 7 Come 11 now on the air.

"Good evening, radio fans. This is the Forestry Club of the University of Montana broadcasting a varied program of songs, stories, readings, and musical numbers from around a campfire up Pattee Canyon over a special leased wire to the KUOM Studio on the University campus—A thousand pardons! That noise you have just endured is not static, but it came from Jeremiah, our pack-mule who wandered too close to the microphone. The grand piano you will have the pleasure of listening to later on was brot up on Jerry's broad back. (One second folks while we move the microphone out of the way of the smoke from the fire.)—Our serenaders are now ready to compete with Jerry in giving you a few vocal selections; all right fellows!" And so into the ether, and far into the night, was projected the first Forester's Amateur Broadcasting Program ever put on in Montana (or anywhere else in the United States, we believe!)

The school has plenty of talented foresters as was evidenced before the evening was over. The Instrumental Trio, composed of Norman Benson, violinist, Elmer Luer, musical sawyer, and Miss Campbell, pianist, and the baritone solos of Carl Beall with Miss Blumenthal accompanying at the piano, were given a particularly fine reception.

Andy Krofchek's cowboy philosophy and Salt Harmon's mouth organ solos were also well received, both by those around the campfire and by listeners in.

Carl Jepson's "Western Sketches," and Bruce Centerwall's "Reflections of a Lookout" further carried out the spirit of the out-of-doors; while the Forester's Quartette, composed of Ruth, Benson, Luer, and Dix, sang their audience into memories of college days and campus ways. A "hot" argument between John Brothers and William Hugus took well over the radio; these boys both hail from Dixie-land. "Oily" Cook put across a bear story while Prof. Faye Clark and Elmer Luer made the air lively with their "Oh Susannah," "Golden Slippers," and other popular tunes, played on the guitar and saw.

Andy Staat talked on foresters in school activities, Kester Flock, on the history and development of the Forestry Club, and Howard Dix, on the history and ideals of Druids.

Waldo Whetterling, Iver Love, Art Fallman, Bill Davis, Gordon Wallace, and many of the others mentioned above were responsible for the serenade numbers and helped dispose of the cider and apples which the Kappa that's known as Lillian donated to the good cause.

Towards midnight, Jerry the mule became restless and brayed to go home. This ended the broadcasting party.

7 Come 11 now signing off—.

FORESTRY SCHOOL QUARTETTES

By Andy

Are the Foresters singin' fools? Well, we'll leave the singing part to the decision of an uncomplaining public who have put up with them at various times, but say brother—they're no fools! During the winter quarter the Forestry School Quartettes were called upon by six different organizations for entertainment. Their willingness to do so is shown by the following engagements:

Jan. 15—Kiwanis luncheon at the Florence Hotel.

Jan. 18—Between halves of the Idaho-Montana basketball game.

Feb. 16—Fish and Game Banquet at the Loyola Gym.

Feb. 25—Hoo-Hoo Banquet at the Florence Hotel.

Feb. 28—Fathers and Sons Banquet at the Loyola Gym.

Mar. 4—Lions' Club Luncheon at the Florence Hotel.

About 500 sportsmen attended the Fish and Game Banquet, and guests of honor included the Governor, the Chancellor, our University President, various state senators, and heads of the Fish and Game Commission. This was probably the outstanding engagement of the year.

Two quartettes are regularly organized in the Forestry School, the "Varsity" and the "Sophomore Four." Members of the "Varsity" include Howard Dix, Elmer Luer, Waldo Whetterling, and Andy Staat. Members of the "Sophomore Four" include Bill Davis, Bruce Menterwall, Waldo Whetterling, and Iver Love. It is upon these men that the eyes of the public will focus for musical talent next year, backed by such capable voices as Harold Ruth's, Norman Benson's, Gordon Wallace's and others,—not to mention nor exclude Faye Clark's—"believe it or not!" Quartette activities will be continued this spring in the form of campus serenades.

Perhaps the fact that six *different* organizations called upon the foresters for entertainment may mean that return engagements are not forthcoming—we hope not. No one can become an artist in any line without work and practice, and the organizations have had their off numbers, with "sour notes" predominating, on more than one occasion because of such lack of practice. But the spirit of willingness and friendliness that has characterized the Forestry School men at all times has gone a long ways to popularize them with the several civic organizations and the University.

Let's have a singing Forestry Club next year—come on fellows, you can do it!

FORESTERS IN COLLEGIATE SPORTS

The old Montana spirit in athletics is evidenced by the number of participants in major and intra-mural competition. Although somewhat handicapped by the loss of some of our best athletes through graduation we feel sure that the vacancies will be filled by incoming Foresters.

Football

Lou Vierhus, star tackle and football captain '27 is back filling the position of assistant line coach of Major Milburn's fighting Grizzlies. Lou's good work was evident in the Grizzly line.

Jerry Dahl, varsity football manager, did his bit and completed the season very successfully.

Carl Walker and Clarence Muhlick, two 200 pound linemen, did some outstanding work in holding that line. This was their first year in varsity competition and they, no doubt, will be two of the best linemen the University has produced in a good many years.

Joe Grove, although not winning his letter, was out on the field doing his share toward developing a winning team.

The frosh are getting right in and mixing it and some of them showed up well on the frosh team. Those winning their numerals were: Jaccard, Ruth and McCarthy.

Basketball

Louie Wendt, captain and guard, led Montana through a successful season. Louie, though small in stature, is one of the

Walker
"200 lbs. of lineman"

Muhlick
Varsity lineman
Weights, on the track team

headiest players on the coast. This was his third year at the guard position and, consequently, his last year in varsity competition. We are all very sorry that Louie will not be with us next year.

Track

Muhlick and Grove are the Forester's addition to Montana's 1929 varsity track squad. Both are out for the weights. Muhlick is showing up exceptionally well by putting the 16 lb. shot, consistently, 45 to 48 feet. Grove, though inexperienced, is showing up well and will bear watching in the future.

Spaulding, Flint, and Wallace are representing the Forest School on the frosh track squad.

Baseball

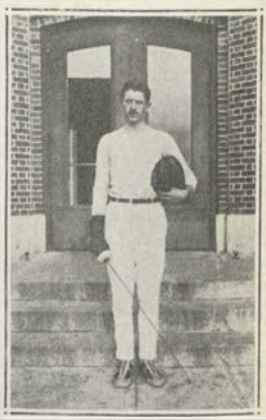
The Foresters won the 1928 Intercollegiate Championship thereby making them champions for two successive years. Despite the fact that the juniors and seniors were up at Seely Lake during the series the underclassmen took our old rivals, the Lawyers, into camp in the final game, to the tune of 9 to 6. The prospects for the coming season look very favorable and we are looking forward to a successful season.

Swimming

"Babe" Ruth won the 40 yard, free-hand stroke, race in the time of 20.6 seconds, clipping 2 seconds off the previous University record.

Wendt
Captain and guard
Basketball

Dahl
Varsity football manager



Beall
Champion fencer

SENIORS

By Charles Rouse

ASHBAUGH, LEONARD, developed his skill with a rifle, shooting prairie dogs in South Dakota. Since coming to Montana he has followed up by being president of the Forestry Club Rifle Team. He is also a member of the University Rifle Team, Scabbard and Blade, Phi Sigma, and Montana Druids.

AVERILL, CLARENCE, is the official photographer of the outfit, serving on the Forestry Kaimin staff in 1928 and on the Sentinel staff this year. He was also secretary of the Forest Club, '27, corresponding secretary of the Druids, '29, and a member of Phi Sigma.

CARLSON, STEVE. "Steve" fed the hungry mob at the "Brawl" in 1928. He is also a member of the Forest Club Rifle Team, and the Druids.

CORNELL, GORDON. As a forester, he is a mighty good bartender, having had charge of dispensing liquid refreshments at the Diamond Dot Saloon at the Foresters' Ball in 1925, '27, '28 and '29. He also acted as bouncer, when necessary, having held the middle weight wrestling championship for 1925, '26 and '27. High point man in triangle meet in 1927, and a member of the Druids.

DIX, H. R. Chief Push of the Foresters' Ball this year. He was also the president of Druids for 1929, and a member of Phi Sigma.

ERNST, EMIL F. "Evil" received his training in finance on Wall Street but he applied it in collecting dues for the Forest Club as treasurer during the last year. Along with his other activities he fed the crowd at the Ball in 1927. Is a member of Montana Druids and Phi Sigma.

FLOCK, K. D. Editor of this year's Forestry Kaimin, he also had experience as an executive, being walking boss of the 1929 Foresters' Ball. Last year he did the landscape gardening in the Ranger's Dream, along with Ken Davis. Among other things, K was president of Phi Sigma, '29; secretary of Druids, '29; Forest School Executive Board, '29; assistant business manager of the Forestry Kaimin, '28, and a member of Kappa Tau.

FRITZ, NELSON, has been responsible for the novel tickets and programs at Paul Bunyan's annual celebration for the past five years. "Nels" also published the Forestry Kaimin in 1927 and 1928. During his spare time he also took part in some of the other campus activities, such as: President of South Hall

Club, '24; Forestry Club Executive Board, '24; Druids; Phi Sigma; Masquers, vice-president '25, business manager '28; varsity track squad, '25; yell king, '27 and '28; central board, '27 and '28; Silent Sentinel; Interscholastic track meet committee; Senior committee, Class Day exercises; Traditions Committee chairman, '27 and '28.

FROST, L. M., came here from Idaho last year to learn some of the finer technicalities of herding sheep.

JACKSON, "CHET," "Pong" or "Stonewall" served the drinks at Paul's "hoe-down" this year. He was also a "straw push" up in the woods getting boughs for the decorations. A member of Montana Druids.

JOHNSON, J. W. "Tennessee" came to the big Northwest to learn the essentials of handling the "big sticks." He served as bouncer and bartender at the Ball in '27. Is a member of the Forest School Rifle Team and Scabbard and Blade.

KROFCHEK, "ANDY," dished out the nose bags at the Forester's Ball in '26 and '27. In 1928 Andy was president of the Forest Club and vice-president of the Druids. Treasurer of Druids, 1929.

LUER, ELMER E., played on the Forest School's baseball champion team in 1927. Was one of the "straw bosses" in the woods getting boughs for the Ball in 1928 and served on the entertainment committee for the Ball this year. Member of the Druids. Outside the Forest School, Elmer is a member of the Grizzly Band, Kappa Kappa Psi, and Phi Sigma treasurer, '29.

NELSON, DONALD W., "Don" was the push on the logging crew that got the decorations for the Ball in 1928. He also had charge of the transportation for the Foresters' Hike last fall. Is a member of Druids and Phi Sigma.

ROUSE, CHARLES, was one of the interior decorators for the Ball in 1928. Aside from that he also has had a monopoly on vice-presidencies during the past year, being vice-president of the Forest Club, Druids and Phi Sigma.

STAAT, FRED, otherwise known as "Andy," assistant editor of the *Kaimin* the last two years, has also been responsible for the serenades the night before the Foresters' Ball. Andy was also a member of the frosh football squad in '25, Glee Club, 1-2, 3 and 4, Bear Paws, Officers' Club, 2-3, Masquers 3-4 and Druids.

VIERHUS, LOU. "Big Lou" is president of the Forestry Club. After four years on the football squad, being captain last year, Lou is now teaching the other fellows how, as line coach. He is also a member of Druids and Silent Sentinel.

SOME NOTES ON FOREST SCHOOLS AND SCHOOL CURRICULA

(Continued from Page 16)

the background of culture so essential to the broad minded forester. The qualities of citizenship, of morality and right living are intangibles imbued in the youngster in the home and by contact with the right type of teacher. If the parents have been real parents, the task of the teacher is easy; if they have failed it is rare indeed that the high school or college instructor can build a stable structure on a sand foundation. I say here, and insist, that parents have the right to demand, in the teachers of their children, higher moral standards than the parents themselves can, or at least do, attain. Practice goes with preaching in building the clean minded, sound bodied type demanded in the forestry profession as well as every public service.

1. How have Professional Schools developed?
   (a) The era of Latin, Greek and "Euclid".
   (b) The literary and debating society age.
   (c) These indicate the college as a field for the gentleman's son.
   (d) Theology in college, Medicine and Law learned in the office.
   (e) Education for the masses, and with it the rise of the Public Institution and the Professional School
   (f) Intensive preparation narrows curricula to professional subjects and a glance at English.
   (g) Gradual lengthening of professional courses. The rise of the Junior College,
      —as a separate institution
      —so-called as a prerequisite to professional training.
2. Forest Curricula.
   (a) Five or six years with 3 or 4 years general undergraduate training. (Is this the reason why the group entering forestry from 1900 to 1910 has had its phenomenal success?)
   (b) The falling off in Forest School registration, the advent of the four year school due to the length of courses in similarly desirable professions.
   (c) With (b) the elimination of all except professional subjects *and* standard requirements in English, the profession is now being served with the graduates of the four year narrow curriculum. The Post Graduate Schools.
   (d) Forestry curricula less narrow than:
      1—Medicine (most schools)
      2—Engineering

3—Dentistry
4—Law (5 years)
5—Commerce

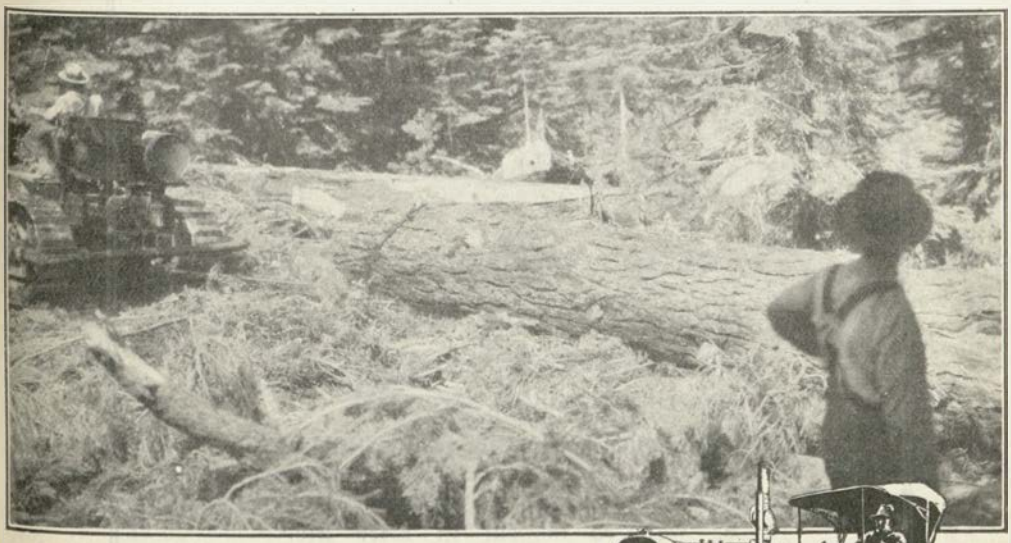
(e) To broaden the curriculum if desirable, requires
1—The lengthening of the course to correspond to Medicine and Law.
2—A change in,
—the civil service examination
—the demand of the Service and the Industry for a finished product.
—unified action on the part of the Schools.
3—The education of the general public. Five year schools were changed to four years because forestry was not attractive enough to warrant the additional year. Is it now?
4—If it is attractive enough in Public Service, is it in the industry or in the private forester of the future? Desire alone does not permit radical changes. The law of supply and demand governs in education as in merchandise.

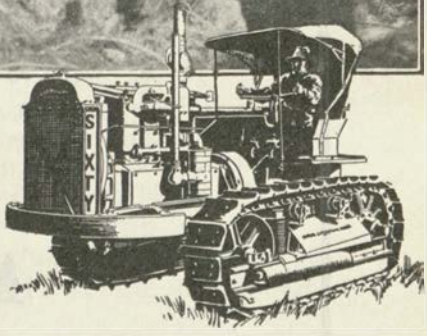
3. Specilization.
(a) Any specialization must require separation of curricula.
1—Engineering (for industry)
2—General Training (for Service)
3—Range Management (for Service)
4—Sales or Office (for industry)
These may be covered in the undergraduate course.
(b) These,
1—Products
2—Experiment Station
demand post graduate work. Since similar positions in other lines demand a Ph.D. or its equivalent the same standard must come in the Service. This opens the field for post graduate schools.
(c) Specialization in regions. Curricula have largely been developed for regions.

4. Education vs Vocational Training.
(a) Inability of student to see value in courses only indirectly related to practice. Different mental attitude than in European institutions.

5. Summary—These things I hold wrong in Curricula
(a) Too narrow.
(b) Too much emphasis placed on Vocational training.
(c) Too much emphasis laid on extra-curricular functions, research, etc., in selection of staffs.

They save the young trees





Weaving in and out around the thickets; shuttling back and forth among the saplings, "Caterpillar" Tractors take the logs from stump to landing—much of the second growth is unharmed—so is reproduction encouraged. Present profits are won by savings in cost—future profits are assured by saving the young trees. In any program of "sustained yield logging" "Caterpillar" track-type tractors are willing helpers.

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(d) Too much stress laid on enrollment and not enough on quality or adaptability of student.

(e) Too much science and not enough pedagogy among the teachers.

The Schools will either lead or meet the profession in whatever changes the future may bring forth. Do not lose sight of the fact that Forestry discussion anent its Schools is parallel to a similar controversy in *every profession* and along similar lines. Is the whole educational system wrong or are the professions themselves at fault?

These are but a few notes gathered at random. The field is yet untouched.

THE FOREST SCHOOL RIFLE CLUB

(Continued from Page 60)

ly a month and by that time the upper class members of the team were burning the oil in the "wee sma' hours" in preparation for the civil service exams.

We entered a team in the Garden City League matches but partly due to lack of sufficient practice and partly due to lack of experience in match firing with its accompanying nervous "St. Vitus Dance" and wobble of the front end of the rifle, the team as a whole was in the vernacular "not so hot."

However, Step and a Half Beall helped maintain our reputation by placing second in the League as well as in the iron sight division of a national prone match.

Anyway we do not shoot just to win but for the enjoyment of hearing the pop and the club can look forward to next year with an anticipation of more satisfactory results for the year will be started with the better rifle at hand while this year we had to wait until January before they came and in the meanwhile the interest had dwindled. So let the present members get out in the spring and practice on the outdoor range and keep in mind that another year is coming during which they can recoup lost favor with the Gods of Luck and Riflery by getting out and boosting and shooting.

ONE HUNDRED AND FIVE MILES OF RAPIDS

(Continued from Page 36)

of scenic splendor. The beauty was unmarred by the hand of man. The river is a continuation of rapids from one end of the canyon to the other and each bend brought forth interesting surprises. Once, rounding a bend, we came upon a herd of five elk standing in the water. They displayed very little fright and two stood at the water's edge and eyed us curiously as we slipped by less than thirty yards away.

Bill had ambitions to take a turn in the boat with Frank on our next move. On Sunday morning he climbed into the bateau and with a long line attached to the shore practiced paddling in the eddy. As he gained confidence, he released the rope and paddled about among the drift in the eddy which had a way of filling an emptying periodically.

I was startled by Frank's cry, "My God! Look at that!" We all ran for the shore shouting and gesticulating. Bill was at the outer edge of the eddy calmly paddling down stream into the channel toward the rapids. He suddenly discovered his plight, and began to back paddle with all his might. In what seemed hours, he had checked the heavy boat, and Providence with him, as it seemed always to be on that trip, the eddy began to refill and gradually with the aid of the frantic paddling, the boat was drawn back toward the new vortex of the eddy. Bill had learned a lesson. That evening he confided his fears and told us, for the first time, that he could scarcely swim a stroke.

The following day our line took us to the base of a perpendicular cliff which we named and which is now known as Castle Bluff. Finding the water along the face of the cliff too deep to wade, we went back to detour over the top. When Claud and I had climbed to the top, we sat down to wait for Bill. When he failed to appear, we called. Receiving no reply we feared something might have happened to him and climbed back to where we had left him. We found him sitting astride a scrubby little tree, some forty or fifty feet above the jagged rocks at the base of the cliff. He had slipped and lodged there; too scared to move or call he clung desperately to the friendly tree. It took us practically all that afternoon to extricate him from his predicament; had be fallen he would surely have been dashed to death on the rocks below.

That lesson failed to register. Two days later, returning from work, he again attempted a short cut across the face of another cliff. This time we saw a cloud of dust and heard an avalanche of rock hit the water. Claud and I scrambled to the river's edge as fast as we could. Bill had fallen thirty feet into ten feet of water. He had struggled to the surface and was holding to the face of the cliff when Claud reached him and pulled

him out. How he escaped unhurt, or how he ever came to the surface with heavy boots, compass, revolver and belt ax, is still a mystery.

We selected our next camp site at the head of another dangerous rapids. We portaged the outfit past the Castle Rapids and I saw the raft with the three go safely round the bend past Castle Bluff. As soon as the raft was landed, Frank was to return for me and the boat, while the boys made camp. Late in the afternoon, Frank returned and between sputterings told how they had passed the camp site before they were aware of it. Frank had jumped ashore and grasped the blade of the sweep but the current had spun the raft around and pried him off the shore. Claud dived under the raft and grasped the other sweep, but he, too, was forced to let go just as it hit the rapids and disappeared in the spray.

The three then tried to follow, clambering over cliffs and through brush in the hope of catching up with it. They came to a big bend in the river and by climbing over a cliff, got a good view of the river beyond, but the raft was nowhere in sight. Exhausted and disheartened, they started back. Coming out on a point overlooking a part of the river, they discovered the raft lodged in a small eddy just across from them. It had passed under a sweeper near the shore and the canvas covering had caught on a knot. Frank and Claud swam the river and with the aid of an ax soon made a small raft on which they returned for Bill. We had lost our best camera, our stove and a number of tools, but our essential equipment was saved. The boys made camp at our new location and the savory smell of frying fish greeted Frank and me when we reached camp late that night.

Game animals common to this region were plentiful. Scarcely a day went by that we did not see bear, deer and elk. Beaver, otter and mink were not uncommon. We saw snow white marmots, with their black noses and feet, foraging grass for their winter cache. These fat, sleek, little vegetarians were very plentiful and extremely tame, and startled us daily with their shrill whistle as we worked along the river.

We had heard much of the "Irish Railway," an extremely dangerous rapids, and were constantly on the alert for it. When we did reach it, we were almost into the current before we realized our predicament. Frank and Bill had gone ahead with the boat. As we rounded a bend with the raft, we saw Frank running over the boulders toward us, waving and shouting. We heard a roar. At that moment our raft slid through a trough between two rocks and I was lifted completely off the raft by a wave which hit my sweep. As I rolled back on, Claude threw a line to Frank on the shore who snubbed us in. He had seen us coming and had run back to warn us just in the nick of time. We portaged our outfit for half a mile through tangles of brush,

over boulders and logs to the beach below the rapids. We then cut and peeled long poles and proceeded to skid our boat over the boulders around the rapids. To add to the discomforts of that day, the no-see-ums hung around in swarms and drove us nearly frantic until we got into our outfit and doped our faces and hands.

We had stripped our raft of everything including the sweeps. Carefully calculating the effects of the current, we let the raft down by line to the righ place, then set it adrift. All might have been well, but a submerged rock swung the raft slightly out of its course. It was caught in the boiling rapids and spun around like a chip; a moment later our twenty-six foot raft was standing on end in midstream, half submerged against a huge boulder. It looked as if we might be able to free it with a rope. Claud, in true western style, roped a corner of it with our three-quarter-inch line. We made a Spanish windlass, a contrivance with tremendous leverage to wind the rope. We found, however, that the new rope would not hold and began to figure ways and means of recovering the rope without serious loss. Here the little .22 came into play again. Claud cut that rope not a foot from the raft in three or four shots. Our next raft served two moves farther before it also was destroyed in a rapids.

Running rapids was a continuous performance on moving days and had a queer fascination for us. To stand braced on the deck of a raft wielding a twenty-four-foot sweep and trying to dodge all the rock in a brimimng gorge with waves waist deep rolling over you, is an extremely ticklish and exacting job which requires the minute co-ordination of mind and body, the more so, if your cargo is the precious food which means success or failure to the expedition. Sites large enough to make camp on were not plentiful in the canyon, yet we never wanted for a beautiful spot large enough for our tent and fly.

Moscow Bar is a small flat, the site of an old placer camp, and the twin cabins which once housed the miners who had waded and boated up the river, still stood, but were slowly rotting to the ground. Our meat was running low and as deer were using the old building for a lick, we began to have designs on those deer. We nailed cleats across the windows of the rickety old cabin and swung a crude door with a trip trigger above the entrance for a trap. It seemed easy. A deer upon entering, tripped the string and the door dropped behind him. After setting the trap, we visited the cabin morning and evening. The third morning our trap had been sprung but our meat was gone. Our deer had squirmed out through a small hole beneath the walls.

The trap was reset, but no more deer entered. We then resorted to our .35 automatic, and although deer had been seen daily, true to tradition, we saw none when carrying the gun.

With our meat supply now completely exhausted and still two or three weeks work ahead, we were becoming desperate. Claud and I decided to drop down the river to the nearest settler and back pack some meat and other necessities. Taking our third raft, we dropped down thirty miles to where our map showed a trapper's cabin. The cabin was easily found, but the trapper was gone as was all his food except one old mouldy pork shoulder suspended from a rafter.

We then dropped six miles farther down the river to the cabin of an old settler, who, to our disappointment, was also out of meat, but who supplied us with the other provisions we needed. This man was the first human being we had seen or spoken to outside of our own party since leaving the Bungalow, two and a half months before. Abandoning our raft, we loaded our packs and started back on our thirty-six-mile tramp up the canyon. After wading and rewading the river many times, we reached camp about noon the second day. On our way back we had helped ourselves to the mouldy shoulder of smoked meat. I never dreamed so much good, savory meat and soup could come from one old shrivelled shoulder joint as Frank got from that one.

Frank cut and peeled cedar logs for our fourth raft, which served us till we reached Asahka. Our camp in the canyon between Skull and Quartz Creeks was on a bar beside a stretch of quiet water, the first and almost only quiet water we encountered along the river. It was a beautiful spot, peaceful and silent, save for the occasional splash of a beaver who, at night, used our raft for a diving board, or the faint murmur of the rapids below wafted to us by the breeze. The boys laughingly remarked that the quiet kept them awake.

At Twin Creeks we found the remains of an old cabin built on a huge boulder under which the creek flowed. It was the only place in that locality which was big enough and level enough for a cabin. One evening, sitting around our fire, Frank told the story of the two prospectors who had built the cabin. Tony, one of the men had gone to a cache for supplies and upon returning that evening, found the door open and his partner gone, although his hat and coat were in the cabin. Tony anxiously, but patiently, awaited the return of the other man for many days but he was never seen or heard from again. The solitude and the continuous gurgling and rumbling of the creek beneath the rock floor of the little cabin, preyed upon the man's mind until, when found, he was raving mad. He imagined his partner was under that rock, mumbling and grumbling, trying to get out.

In addition to his many accomplishments, Frank was also an ardent fisherman. Fried or baked trout was found on our table almost daily. He took his rod one morning and headed for a narrow rock reef, some ten feet high, which projected into a pool a short distance from camp. Climbing to the top of this

perpendicular reef, pole in hand, almost breathless, eager to cast his line into the swirling water, he nearly collided with a huge brown bear coming up the opposite side, not five feet away. Frank was no coward, but he must have suddenly decided the place was too crowded, for he dropped his pole and fell backward into the mud at the base of the ledge, and in an incredibly short time was out on the line with us. We gave him our gun, and although he hunted most of the day, the bear was not seen again.

Our survey was completed at Asibella Creek, and on September 22nd, just three months from the time we left Orofino, we loaded our boat and raft with our luggage for the last time and started down the river to Asahka. It was a three days' trip. The water was now at low stage and we were kept busy dodging rocks and helping the raft over shallow places.

We were a wild and weird looking crew, the most ragged bunch of tramps that I have ever seen, canvas patches from head to foot, but happy, healthy and hard as nails. We abandoned our boat and raft at Asahka, also our rags, bade good-bye to Frank and boarded the train for home.

The traveler into the North Fork of the Clearwater today will find a much used auto road to the site of the old bungalow, and a wonderfully scenic and well beaten trail, carved for miles through solid rock, traversing the entire length of the canyon to Asahka.

THE UPPER MISSISSIPPI RIVER WILD LIFE AND FISH REFUGE

(Continued from Page 38)

A study was also made by competent botanists of the plant life on the area, with especial reference to plants suitable as food for ducks and fur-bearing animals that frequent this region.

After the land had been mapped and appraised, the ownership data were obtained from the county records, and tax figures were also made available. Every landowner was given a file number, and a special report of his land was made. These reports showed the acreage, description, types, accessibility, timber values, and our appraised values as well as the assessed value.

The next job was to locate the owners, which numbered several thousand, and begin negotiations for the purchase of their lands. A corps of attorneys and men specially trained for title-examination work was employed. Innumerable obstacles were encountered in this step of the work. For instance, in the north part of the area the lowlands along the river are used by local farmers as grazing places for their stock. In certain localities the timber values were so high that with our fixed average price we could not meet their demands at first. In other areas the swamp land had previously been purchased by sports-

men's organizations for purposes of their own and held at exhorbitant prices which we could not offer. Many lands were tax delinquent and the owners could not be located. In other words, it was a sellers' market and not a buyers' market, and on that account we were up against it, so to speak. The most practical and the easiest way out of this dilemma seemed to be by a process of educating the people to the value of the proposed Refuge. This was largely accomplished through newspapers and magazine articles and innumerable short talks by the superintendent at public meetings. I am glad to report at this writing that the majority of the people are beginning to appreciate the value of this project, not only to themselves but to their posterity. Land acquisition moved forward rapidly for a time and is still progressing satisfactorily.

It is planned as soon as the land is completely purchased to put it on a forest and wild-life management basis. There are some thirty or forty species of hardwood trees on the area. The upper end of the Refuge contains elm, ash, birch, cottonwood, aspen, maple, willow, oak, hackberry, basswood, and other trees, while farther south a greater variety of trees occurs, such as black walnut, butter nut, hickory, pecan, locust, cherry, and the sycamore. There are oaks, maples, elms, etc., of quite a number of species.

With such a variety of trees as these there is a considerable source of supply for wood-using industries. The trees that are most valuable as sources of food for game are the ones of particular interest to us. With this in mind our foresters have already planted a considerable quantity of black walnut, both seedlings and nuts, butternuts, and chestnuts, both native and Japanese. At present we are experimenting with beech and bald cypress *(Taxodium distichum)*, which we feel should survive in the swamps of Iowa and Illinois.

Several thousand conifer seedlings were transplanted from a co-operative nursery in Winona and from sources in northern Minnesota. Among these trees were: Black spruce, red pine, jack pine, and white pine. An experiment was begun last spring with jack pine on the Savanna National Forest, a part of the Savanna Proving Grounds, which is located just north of Savanna, Illinois. About 2000 two-year-old seedlings were planted on the sand prairies just north of the ammunition store houses with a view to offering shelter to game birds, such as prairie chickens, quail and pheasants. These trees were planted in arc-shaped rows about 30 feet long and in three rows, each tree staggered from the one in front of it and about twelve inches apart, thus tending in time to form a barrier to wolves, foxes, and predacious birds. These plantings were examined in October, six months after planting, and about 90 per cent of them were found to be in good condi-

tion. Of course, as the trees become larger, some thinnings will necessarily have to be made.

From the forests along the river, a large part of the timber is used for fuel by local farmers, many owning small woodlots of from 10 to 80 acres. However, most of the willow brush, which is found on the mud flats and upon the accretions that have built out into the river, is being cut and used by the War Department for the construction of wing dams, which are built to aid navigation. One large concern in Wisconsin utilizes the maple, birch, and cottonwood for coat hangers to supply most of the eastern hotels. Still another concern in Iowa uses the ash for butter tubs, there being no odor from this wood to injure the contents. There are numerous portable outfits along the river that use the elm and birch for fish crates. The larger saw timber is used for box lumber, building materials, and railroad ties.

In many instances the land is purchased together with the timber on it, but where the timber values are high, liberal reservations are allowed the vendors, permitting them to remove certain quantities of wood under government supervision either for fuel or for lumber. It is planned to reforest much of the area and keep it on a sustained yield basis. Timber sales will be conducted from time to time as is done on the National Forests. The Refuge, however, was not established with a view to direct revenue but rather to assist in the conservation of wild life.

The chief purposes in the minds of those who started this project was to provide a sanctuary and breeding place for migratory birds and incidentally for local game, fish, and fur-bearing animals. Already several pairs of beavers have been trapped alive in northern Wisconsin and Minnesota, and "planted" in suitable localities in the upper portion of the Refuge, and there is no reason why this great valley should not be fully stocked with valuable fur-bearing animals.

Muskrats are quite plentiful in certain parts of the Refuge, chiefly in the Zumbro Bottoms and La Crescent Marshes on the Minnesota side, and in the Winnesheik Bottoms on the Wisconsin side, opposite Lansing, Iowa. Many thousands of acres of marsh land and water in the Refuge are especially suited to these animals.

The Upper Mississippi Valley is one of the main arteries or routes of travel for migratory birds in making their annual flights north and south, and it is for the purpose of establishing "tourist camps" or resting places for these birds that this particular site was chosen. Already certain islands and lakes have been closed to hunting and the ducks seem actually to read the signs "Closed Area." Last fall a government island of 1200 acres, lying in the upper end of the Refuge was posted. Immediately a delegation from the adjoining town stormed the office and demanded of the superintendent that the drastic order be rescinded. He turned a deaf ear to their protests, however, and hardly a month had passed before the ponds and sloughs on the

island were alive with thousands of mallards, pintails, blue bills, and teal, and even some Canada geese settled there. This resulted in considerable hunting and good hunting, too, on other areas adjacent to this island. One of the rangers was patrolling one morning in a nearby slough, when he chanced upon an old veteran who was carrying several ducks, and it was then quite early in the morning. The ranger questioned the old gentleman as to how the hunting was this year and quite to his surprise received the reply that it was the best duck hunting he had seen there in the last ten years. The old man, one of the recent "growlers," had to confess that the game refuge was already proving a success, at least from his point of view.

Wild rice, field corn, and other foods are being made available for the ducks in the closed areas, and it will not be long before this river will become a reasonably safe route of flight for ducks and geese, along which they may feed and travel leisurely and where they will nest to a much greater extent than for many years past.

The Refuge is to be patrolled somewhat like the National Forests, except that the modes of travel are quite different. In spring and summer, when the river is open, the rangers and patrolmen use swift, shallow-draft patrol boats. Small skiffs, equipped with outboard motors, and canoes are used for navigating the in-

land sloughs and lakes. In winter, when the river and sloughs are frozen, snowshoes and skis are used as well as automobiles, when the roads are passable. There are already several cabins in strategic points, some in the lowlands, built on stilts to be above the high water, and some on the bluffs, from which a large area can be scanned with the aid of field glasses.

While fires are not so big a hazard as in the coniferous forests of the Rocky Mountains and the Lake States, grass fires do occur and they do considerable damage to young timber. In the past, fires in the grass, marsh lands, and brush have resulted in much loss to game. Therefore the rangers or reservation protectors have been supplied with suitable fire-fighting equipment, including a portable, twin-cylinder power pump outfit. It is planned to have the patrol boats equipped with these portable pumps in order to give more and better protection. Lookout towers connected by telephone lines are part of the protection program.

We feel certain that the time is not far distant when the American people as a whole will appreciate the value of this project, not only to themselves, but to posterity.

FORESTERS' HIKE

(Continued from Page 59)

girls! Mrs. DeJarnette being so acclaimed by her husband, who is himself a sturdy Alabama product. Mr. DeJarnette, one of the most active honorary members of the Forestry Club, has never missed a Forester's hike or Foresters' ball for the past 10 years and he was called on for reminiscences, as was Prof. Waters of the Botany department.

Fay and Elmer next snapped the crowd to attention with their guitar-musical saw, instrumental combination. It was indeed a treat, and the boys will miss Elmer's soulful wails when they meet again next year around the campfire. With Fay it's different, and his Oh, Susannah and Golden Slippers will be heard again!

Andy Krofchek followed on the "Last Chord" of the two melody makers with a couple of descriptive cowboy poems (and Andy was certainly dressed the part to "put her across" big).

"Salt" Harmon next stepped into the circle and emitted some peppy tunes from his mouth organ. Following Salt's artistry, the Forestry School serenaders vocalized—Iver Love, Bill Davis, Faye Couey and Andy Staat warbled barber shop discords, while Bruce Centerwall completed the effect on his banjo, with Salt Harmon furnishing the whiskey tenor in the offing.

Close on their heels came the now famous solos of "Nels" Fritz—the celebrated "Over the Wyeaduct," "Foolish Questions," and "Billboard" ditties.

"Tiny" T. Johnson next aggravated the funny bones of his

listeners with his startlingly true(?)-to-type "Imitations" and "Stories."

Maynard Cook again contributed with another extravagant tale, and then the Forest School orchestra, comprised of Fay Clark, guitar; Elmer Luer, musical saw; Norman Benson, violin; and Faye Couey, cornet, led the gang in a community song. The Four Musicians from Bremmen had nothing on these babies!

Following the singing, Ramona Noll and Evelyn Blumenthal entertained with harmonious duets to their ukelele accompaniment. The fair co-eds were getting away big when someone happened to shout, "come and get it!" The effect was like Instantaneous Postum and Dean Spaulding's impromptu speeches rolled in one; the crowd rose to the occasion, and while the girls busied themselves with roasting hot dogs, the fellows formed in line for the coffee, buns, and apples. Toasted marshmallows followed the repast; what a feast it was! Then, with the campfire burning low, and the assembled company standing around, Fritz and Krofchek again entertained; the former with his humorous, negro dialect stories, and Krofchek with his soliloquy on "Temptations." At any rate, the crowd was in a thoughtful mood and the lights were low so that the time was ripe for Andy's little sermon, which no doubt everybody took to heart—but immediately forgot on the way home.

A fitting talk on the observance and meaning of the Foresters' hike tradition was brought out by Kester Flock, active club member and secretary of Druids.

"The Kappa That's Known as Lillian" followed up K. D.'s line of thought with remarks directed for and at the Freshmen Foresters. Following Miss Shaw's well-chosen little speech, Carl Beall, "one of the old grads," gave reminiscences of "the days gone by," and at the conclusion of his memory vein, "College Chums" was sung and the hike homeward began.

Over 100 couples were present on the hike; almost a hundred per cent turnout for the Forestry School!

Chaperones for the evening were: Dean and Mrs. Tom C. Spaulding and Prof. and Mrs. Irwin Cook.

The committee responsible for the success of the hike was made up of Donald Nelson, transportation; Chet Jackson, general arrangements and food; "Evil" Ernst, moral support. Jack Yost. Hugh Redding, and Andy Krofchek were the fire tenders and served on the "eats" committee, while Lillian Shaw acted in the capacity of the C. C. B. (Chief Coffee Baler). Andy Staat was the M. C. of the evening.

MAVERICKS

We're scouts in the vanguard of Civilization
Sent forth in a haphazard style
To clear up the way for the vast occupation
That follows us—after a while.
Through jungle and desert and plain we are driving
The roads we set out to prepare,
But once the great "home making" crowd starts arriving
We will not, I fancy, be there!

To desks in an office nobody could clamp us
And that's why we wandered from home,
From store and shop and collegiate campus
To work under heaven's blue dome!
We lay out the grade, and we see that it's metaled;
The country we blue print and plot,
But when it begins to be humdrum and settled—
We go somewheres else, after that!

We pick sites for cities—and never live in them;
We build power dams—then we blow;
We put in the turbines—and let others spin them,
While we find a new place to go.
For there are still places—Thank God!—in creation
For rovers and light footed bums,
Behold us, the vanguard of Civilization
Who beat it away when it comes!

By Berton Braley.

MY FIRE

How simple
Seems my cheerful fire,
Yet I know to light this flame
Giant forces strove together
From the dawn of time.
Long ever *chemistry*
Was in the thought of man
Creative elements were bringing forth
The substances that kindle on my hearth;
Before the word *geology* was spoken
The place, the very place, was chosen
Where this tree that now I burn
Should root and live its rich free life.
At last
The long, long day of preparation
Ended and came the hour
When came the tree!
What joy it had throughout the years
Stretching upwards towards the sky:
Through it thrilled the song of birds,
It was a harp for the winds,
Into its deep heart spilled the sun
And rested chaliced there.

Now broken and dying it lies,
Sacrificed for me!
How complex
The slow process of the ages
That built this cheerful fire, at which
I warm my body,—and my soul.

FRIENDSHIP

This world is filled with pleasure;
With joys both good and kind,
But when we scan its measure
This simple fact we find:
From out its hoard of treasure
No joy that living lends
Is equal to the pleasure
Of simply being FRIENDS.

ANON.

MY CREED

"To live as gently as I can;
To be, no matter where, a man;
To take what comes of good or ill
And cling to faith and honor still;
To do my best, and let that stand
The record of my brain and hand;
And then, should failure come to me,
Still work and hope for victory.

To have no secret place wherein
I stoop unseen to shame or sin;
To be the same when I'm alone
As when my every deed is known
To live undaunted, unafraid
Of any step that I have made;
To be without pretense or sham
Exactly what men think I am.

To leave some simple mark behind
To keep my having lived in mind;
If enemity to aught I show,
To be an honest, generous foe,
To play my little part, nor whine
That greater honors are not mine.
This, I believe, is all I need
For my philosophy and creed."

BORROWED.

TIME

There's a time to part and a time to meet,
There's a time to sleep and a time to eat.
A time to work and a time to play,
A time to sing and a time to pray.
There's a time that's glad and a time that's blue,
A time to plan and a time to do,
A time to grin and to show your grit,
But there never *was* a time to quit!

Directory of Forestry School Alumni, revised to April 23, 1929. We have endeavored to make this directory as accurate as possible, but it is hard to keep in touch with everyone. Any corrections will be appreciated.

Adams, L. B.....Thompson Falls, Mont.
Anderson, H. E.....Alberton, Mont.
Principal, Alberton High School.
Baggs, J. F.....Camp No. 2, Clearwater Timber Co., Pierce, Idaho
Beall, Carl.....Forest School, U. of M., Missoula, Mont.
Bishoff, P. A.....1533 Helena Ave., Missoula, Mont
Bitney, R. H.....U. S. Indian Service, Klamath Agency, Oregon
Bloom, C. W.....U. S. F. S., Thompson Falls, Mont.
Bowers, Raymond.....Renton, Wash.
Brown, W. L.....County Engineer, Superior, Mont.
Campbell, L. S.....732 Gerald Ave., Missoula, Mont.
Canfield, R. H.....Box 671, Las Cruces, New Mexico
Jornada Range Res.
Colville, L. L.....U. S. F. S., Bend, Oregon
Cramer, J. A.....422 Ford St., Missoula, Mont.
Crowell, R. E.....Lolo National Forest, Missoula, Mont.
Davis, Kenneth.....U. S. F. S., Grey Cliff, Mont.
Draproza, J. D.....Bur. of For. Manilla, Philippine Islands
Emerson, J. L.....Extension Service, Mandan, N. Dakota
Fields, R. E.....U. S. F. S., Box 173, Libby, Mont.
Graham, D. H.....1032 Stratmore Ave., Crafton, Pa.
Hicks, H. W.....Biological Survey, Federal Bldg., Winona, Minn.
Koziol, F. C.....U. S. F. S., Ogden, Utah
Kumler, C. G.....U. S. F. S., St. Maries, Idaho
Lambert, L.....Suirrey, N. Dakota
Lee, B.....U. S. F. S., Portland, Oregon
Logan, Jose B.....Echague Isabela, P. I.
Lukens, Stanley.....U. S. F. S., Phillipsburg, Mont.
Markham, Murle.....U. S. F. S., St. Anthony, Idaho
Matthew, L. S.....Extension Forester, Bottineau, N. Dakota
Merrill, L. P.....Weyerhauser Timber Co., Klamath Falls, Ore.
Merryfield, LeRoy.....U. S. F. S., Ennis, Mont.
Nickolaus, C. A.....McClure, Virginia
Painter, W. F.....618 Realty Bldg., Spokane, Wash.
Preston, J. C.....U. S. F. S., Estes Park, Colorado
Riley, L. C.....Bureau of Plant Industry, Spokane, Wash.
Roemer, A. A.....U. S. F. S., Livingston, Mont.
Rowland, Thomas.....U. S. F. S., Missoula, Mont.
Rubottom, C. V.....U. S. F. S., Augusta, Mont.
Russell, H. E.....Clearwater Timber Co., Pierce, Idaho
Schwan, H.....U. S. F. S., Missoula, Mont.
Shaw, D. W.....U. S. F. S., Durango, Colorado
Spaulding, Clarence.....Missoula, Mont.
Bitter Root National Forest.

Tennant, E. C. ..... Lolo National Forest, Missoula, Mont.
Tennant, Ray ..... Lolo National Forest, Fishtrap, Mont.
Thompson, J. B. ..... U. S. F. S., Priest River, Idaho
Van Meter, T. ..... U. S. F. S., Ogden, Utah
Van Winkle, H. H. ..... U. S. F. S., Ogden, Utah

Directory of Forestry School Students, 1928-29:

Name	Class	Home Address
Aiton, John F.	Jr.	Bedford, Iowa
Ashbaugh, L. J.	Sr.	Clear Lake, S. Dakota
Averill, C. C.	Sr.	Missoula, Mont.
Beall, Carl F.	Pg.	Missoula, Mont.
Benson, N. B.	Fr.	Omaha, Neb.
Bernard, Hugh C.	Jr.	Kalispell, Mont.
Bland, F. C.	So.	Montgomery, Mich
Bonham, C. J.	Fr.	Highwood, Mont.
Brothers, J. P.	Fr.	Birmingham, Ala.
Brown, Dudley T.	Fr.	Palo Alto, Cal.
Brown, Wm. J.	Fr.	Vancouver, Wash.
Calkins, Ray F.	So.	Missoula, Mont.
Carlson, Sture R.	Sr.	Missoula, Mont.
Caswell, Ormonde	So.	Missoula, Mont.
Centerwall, Bruce	So.	Crystal Bay, Minn.
Chapin, W. E.	Fr.	Missoula, Mont.
Cooney, R. F.	Fr.	Canyon Ferry, Mont.
Cornell, G. T.	Sr.	Missoula, Mont.
Dahl, Jerome	Jr.	Cottage Grove, Wis.
Davis, Wm. L.	So.	Missoula, Mont.
Dix, H. Rolland	Sr.	Missoula, Mont.
Ernst, Emil F.	Sr.	New York City, N. Y.
Fallman, John A.	Jr.	Missoula, Mont.
Fenton, D. D.	So.	Bluffton, Ohio
Flint, Alfred A.	So.	Missoula, Mont.
Fox, Jesse W.	So.	Haugen, Mont.
Fritz, Nelson	Sr.	Wilmington, Del.
Frost, Levi M.	Sr.	Salina, Kan.
Fry, Clyde D.	Fr.	Missoula, Mont.
Gail, Charles N.	Fr.	Trail City, S. Dakota
Grove, Joseph O.	Jr.	Glenwood, Minn.
Gustafson, Walter	Fr.	Nine Mile, Mont.
Hall, Rufus H.	Fr.	Judith Gap, Mont.
Hawes, Evans C.	Fr.	New Bedford, Mass.
Hoffman, Bernard N.	Fr.	Missoula, Mont.
Jaccard, C. F.	Fr.	Butte, Mont.
Jackson, Chester	Sr.	Pony, Mont.
Jepson, Carl E.	Jr.	Lake Preston, S. D.
Jost, Edwin J.	Jr.	Missoula, Mont.
Kische, Joe C.	So.	New London, Wis.
Kringlen, E. K.	Fr.	Polson, Mont.
Krofchek, A. W.	Sr.	Colorado Springs, Colo.
Ladiges, R. W.	Jr.	Alberton, Mont.
Larson, Stanford H.	Fr.	Missoula, Mont.
Leavitt, Roswell	Jr.	Great Falls, Mont.
Linke, Robert H.	So.	Washington, D. C.

Lommasson, Thomas		Missoula, Mont.
Love, Iver B.	So.	Rudyard, Mont.
Luer, Elmer E.	Sr.	Missoula, Mont.
McCarthy, Thomas F.	Fr.	Anaconda, Mont.
McPherson, B. H.	Fr.	Anaconda, Mont.
McPherson, B. F.	Fr.	Anaconda, Mont.
Mass, Fred H.	Jr.	Paradise, Mont.
Mathews, John T.	Jr.	Missoula, Mont.
Midtling, Tom R.	So.	Deer Lodge, Mont.
Muhlick, Clarence V.	So.	Missoula, Mont.
Murchie, Archie A.	Fr.	Sarles, N. D.
Neff, Lawrence	Fr.	Missoula, Mont.
Nelson, Donald W.	Sr.	Missoula, Mont.
Noyes, Carl R.	Fr.	Chinook, Mont.
O'Neil, Charles R.	Fr.	Pomona, Cal.
Park, Barry C.	Jr.	Portland, Oregon
Phillips, Floyd H.	Jr.	Salem, Oregon
Pool, Walter E.	Fr.	Torrington, Wyo.
Preston, Clarence R.	Fr.	Kalispell, Mont.
Redding, Hugh S.	So.	Missoula, Mont.
Rouse, Charles H.	Sr.	Libby, Mont.
Rudolph, Rosser	Jr.	Missoula, Mont.
Ruth, Harold E.	So.	Halstead, Kan.
Sparks, L. Earl	Fr.	Missoula, Mont.
Spaulding, Al. E.	So.	Bonner, Mont.
Staat, Fred E.	Sr.	Pasadena, Cal.
Stephenson, James B.	Fr.	Descanso, Cal.
Stillings, Warren H.	So.	Missoula, Mont.
Stocking, Gale R.	So.	Whitefish, Mont.
Taylor, Patrick	Fr.	Willow Creek, Mont.
Thomas, Wm. P.	Fr.	Dixon, Mont.
Tucker, David	Jr.	Missoula, Mont.
Van Huerck, Cornelius	So.	Appleton, Wis.
Verheek, Herbert L.	Fr.	Missoula, Mont.
Vierhus, Louis H.	Sr.	Portland, Oregon
Walker, Carl S.	Jr.	Boundary, Wash.
Wallace, Gordon E.	So.	Tomah, Wis.
Wednt, Louis A.	Sr.	Culdesse, Idaho
Wetterling, W. J.	So.	Kensington, Minn.
White, Jack C.	Fr.	Missoula, Mont.
Woolfolk, Edwin J.	Fr.	Spearfish, S. D.
Yochelson, Albert	Sr.	Missoula, Mont.

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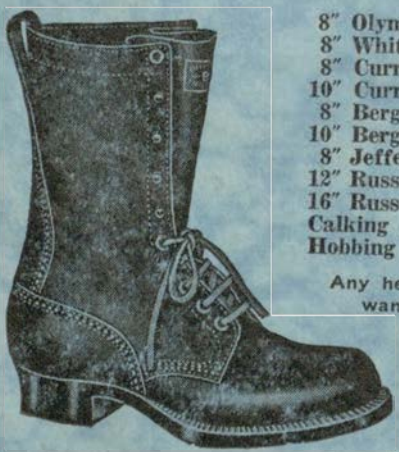

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