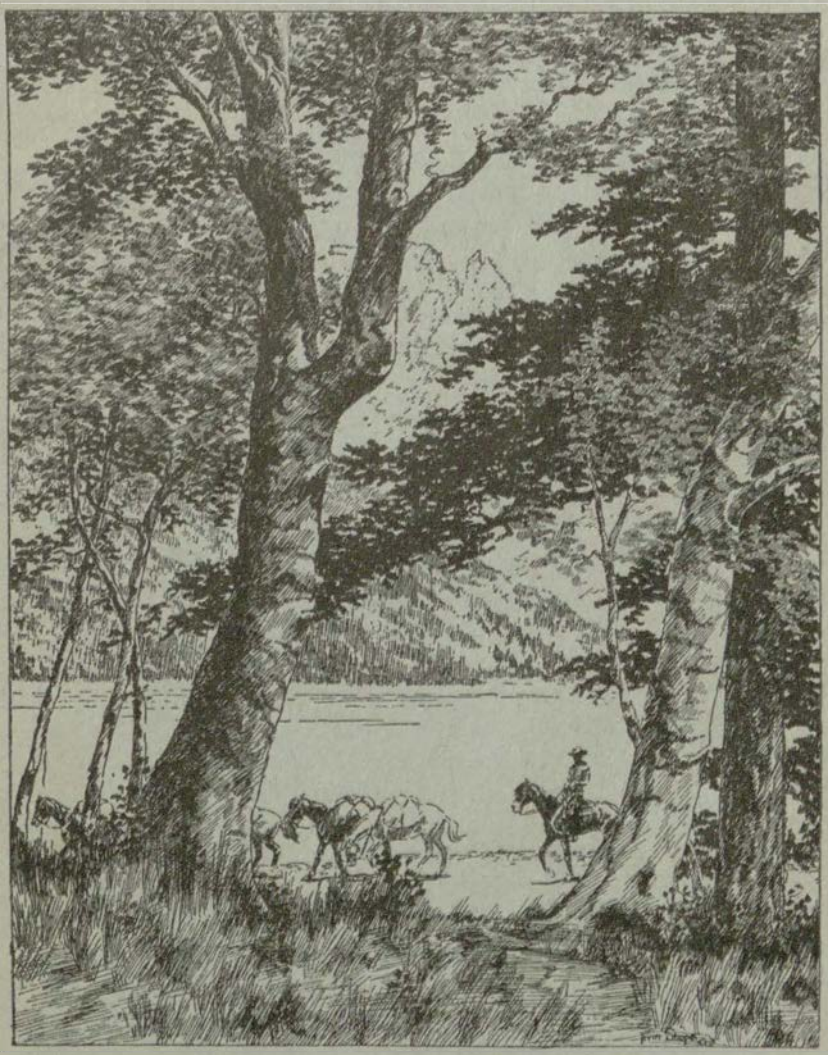

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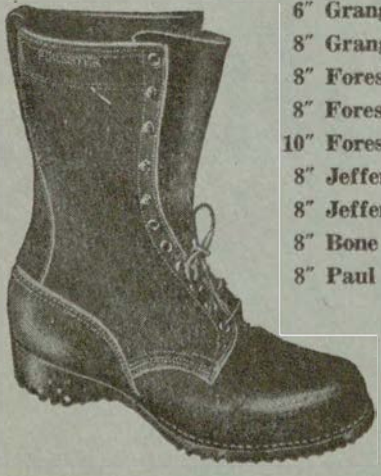

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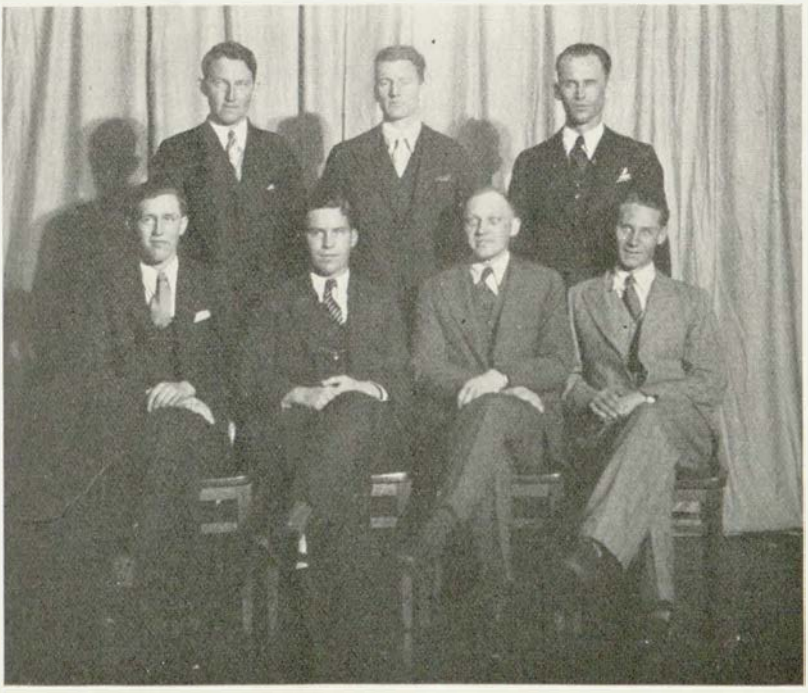
CONTENTS

A SCENE IN GLACIER PARK

J. H. RAMSKILL

To Professor Ramskill, who has been one of the School of Forestry faculty since 1921, who has added much to its accomplishments as he has quietly gone about his business of teaching students, who has given each of us something of himself as we have come to know him during our years on the campus, we respectfully dedicate the 1932 Forestry Kaimin.

The Staff



Coon Whitaker Frykman
Benson Woolfolk Beechel Hawes

THE NEWCOMER IN THE FOREST SERVICE

By Evan W. Kelley, Regional Forester, Region No. 1

The Managing Editor has requested me to tell in the pages of the Kaimin what is expected today by administration, of a newcomer when he enters the ranks of the Forest Service. This is a big order and one of serious import. Whatever form the attempt to make such a statement may take, some of its details, or even its entire purpose, easily may be misunderstood; however, nothing risked, nothing gained! To establish a background for what follows, I shall launch into the important subject by relating a bit of history of a typical ranger's experience in "the good old days."

"Good morning. Your name, please? Oh, yes, Ramsey, from Hightower. I recall your application. Now to business:

"Here are your tools. Take this pocket compass, marking hatchet and map (¼" scale) and report tomorrow at Mountainville—your headquarters until further notice.

"Begin immediately to mark the 60 miles of exterior boundary of the Jumpoff Ranger District. After that job is finished, the spring migration of cattle and sheep to the reserve ranges in the mountains will begin. Count all this stock. Do not let an unpermitted critter enter the reserve. See that every herder has his permit; also his scab and tick clearance certificate.

"With the stock all in, the fire season will be on. Patrol the district for fire. You will need a shovel, axe and camp equipment. These you will buy from your personal funds.

"No. Uncle Sam does not feed your saddle horse or pack mule. That expense is yours. Yes, you will pay your travel expense.

"Your salary will be $60 a month. Going to take the Ranger examination later on in the spring, are you not? Should you pass, you will receive an appointment with an increase of salary to $75.00 per month.

"Hold on a minute. Don't go yet. I note on the county map that you have a lot of private land to trouble you up there on the Jumpoff District. Bear in mind that administration of the Reserves is largely a land management matter. Find your section corners. Learn your land ownership. Find out just as rapidly as possible what is on every acre of land in your ranger district. Miss no opportunity, wherever you may be, to tie yourself in to Land Office corners. Learn all your land facts and know more about the land up there than anyone else.

"And do not let anyone slip anything over on you. Hope to see you later in the year. Good-bye."

The advice about acquiring land knowledge proved sound indeed and, incidentally, its value today to a newcoming Forest Officer, or an old one, too, for that matter, remains unchanged.

Such were the instructions issued some 27 years ago by a brand new Supervisor off the Civil Service eligible list to a

budding Forest Ranger who went into his ranger district as instructed, rattled around in it, and did not see his Supervisor again, or any other superior officer, for nearly 8 months.

This new officer knew neither section corners nor the art of counting sheep. He was not quite sure that he even knew the number of sections in a township or whether the President or the Governor issued patents to homesteads. No superior took the pains to inform him.

Whether to set the declination of the compass needle east or west or how much, he knew not; moreover, his compass was not provided with the means of "setting off" the variation.

For the ensuing two years this chap continued to run circles around himself and was almost entirely on his own resources. In the meantime, somehow or other he learned about the declination of compass needles; how to retrace land lines; the ease or difficulty, chiefly the latter, of finding section corners; how to count sheep in bunches of five and at the same time avoid dizziness as a thousand or more of the woolies passed in disorderly review under his eye. He built fences and cabins with the crudest of equipment, much of it borrowed or personally owned.

The Handbook of a Northern Woodsman by Cary, purchased at his own expense, the Primer of Forestry by Pinchot and the Use Book, then a volume of about 4 x 5 inches containing about 100 pages, were his sole textbooks.

He was his own trainer, and a mighty expensive one if the truth were known.

His responsibilities, never having been indicated, remained vague in his mind. Nevertheless, they weighed heavily upon his conscience. He was chiefly accountable to himself. No Supervisor ever looked over his work. No inspector ever "looked down his collar."

In the course of time his probationary period as ranger slipped by unnoted, except that the Supervisor undoubtedly forwarded to Washington a perfunctory report on a prescribed form.

So most men had their maiden venture in the Forest Service during its formative period. Gradually the understanding of the job expanded but a number of years passed without either this ranger or anyone else knowing very definitely about what was expected of him. And no one gave very painstaking attention to how poorly he was doing even that. Everyone was too busy to do much about finding out in an analytical manner what the job's actual requirements were. This discovery was left to chance.

Under this crude and expensive system of personnel and business administration, romantic and glamorous as was characteristic of most pioneering experiences in the West, many unqualified men "got by." Unfits and mis-fits, as well as the fits,

(Continued on page 55)

"BURROS"

Joel Frykman, '33

While traversing trail the past summer, our burros not only acted as beasts of burden but also as a source of amusement and the learning of a varied language. Mule skinners have long held a reputation of owning a blistering language. But no mule skinner should qualify until he has been apprenticed as a burro packer. Especially after packing 150 pounds on a burro, which is no larger than a good sized calf, through bog holes and over way trails. The blue smoke often seen in the mountains may only be due to a burro packer breaking down the atmosphere. It is agreed that they can pack a large load, compared to their size. For it is not an unusual sight to see a pile of duffle moving down a trail, and, on examination, find a burro beneath it. They are amusing both in appearance and in action. With their comparatively small body, large ears, and ludicrous expression, they would bring a smile to a wooden Indian. Their appetite is as varied as a goat's, relishing pickles, hot cakes, and tobacco. They are sure footed, although our burros rolled down a mountainside, scattering grub "galley west."

The burros have been satirically called "Mountain Canaries." The unholy sound of a dry axle and a screech owl would hardly be called a canary's song.

Our string varied in age from seven years downward. The youngest, little Charlie, nearly a year old, did no work but was a continual source of amusement. He always came at mealtime, if he were near, to beg for a handout. He got into deep water while fording a stream during high water and was nearly washed down stream. He would have had it not been for a lucky hold on his elongated ears. Contrary to popular opinion, our burros were not always willing to stay about camp. Once having eaten their fill, after the day's work, they were ready to travel elsewhere.

FLUCTUATION OF NATIVE GRASS CROPS ON THE NORTHERN GREAT PLAINS

By T. Lommasson, U. S. Forest Service

Extreme shortage of grass on the ranges of the Northern Great Plains in eastern Montana has focused attention upon this region during the past year. Native forage crops are known to fluctuate quite widely owing to the varying climatic conditions prevailing over this section of the state. Nineteen thirty-one has, however, stood out very distinctly as the driest year in the history of recorded weather conditions which have been kept since the sixties at Miles City, Montana. These show that 1931 with a total precipitation of 6.18 inches was the driest year of record and that the driest year up to that time was 1883 when a total of 9.07 inches of moisture was had.

In order to gauge the variation in native forage crop production in this region, a series of studies has been conducted on the Poker Jim Experimental Pasture on the Custer National Forest south of Miles City in southeastern Montana. These have been carried from 1925 to 1931 inclusive, and show a wide spread in the amount of feed produced annually during the period. During these seven years, 1927 with an exceptionally heavy grass crop, and 1931, the driest year of record, represent the two extremes of production, with seasons of varying production between. Such widely divergent conditions in this comparatively short time provide excellent contrasts in fluctuation of the forage grasses occurring in the region. The season 1927 was unusually favorable for growth both from the standpoint of well distributed moisture and accompanying temperatures. The crop produced was extremely heavy, and because it was so much greater than any other crop it is rated as 100 per cent for comparative purposes in this discussion with production of other years being rated against it.

During 1927 all species except dryland sedge (Carex douglasii) showed an unusually heavy crop. This also produced heavily, but the production in 1929 exceeded by 5 per cent the production of 1927. For all other species studied the production of 1927 was outstandingly greater. Two principal factors served to prevent sedge from developing the greatest growth of the period in 1927, these being lower precipitation and mean temperatures during the month of March when this species usually makes appreciable growth. Rainfall for that month totaled .70 inches with a mean temperature of 35.2 degrees, while in 1929 the rainfall totaled 1.72 inches with a mean temperature of 36.7 degrees. It begins growth early and much of its growth is made in March and April.

Seven principal species were studied making up 75 per cent of the forage crop of the area. In the following table comparative sizes of the different years' crop production are shown, as well

as the maximum variation in production by species from the 1927 crop:

Species—	Variation of Production From Maximum	Year	Comparative Size of Forage Crops %
Carex douglasii (Dryland sedge)	22.0%	1925	79.30
Agropyron spicatum (Bearded wheatgrass)	57.0%	1926	59.50
Festuca idahoensis (Small blue bunch)	66.5%	1927*	100.00
Agropyron smithii (Bluejoint)	74.0%	1928	61.90
Andropogon furcatus (Crowfoot)	83.9%	1929	51.40
Bouteloua gracilis (Blue grama)	100.0%	1930	29.30
Bouteloua curtipendula (Side oats grama)	100.0%	1931	26.70

It will be noted that the most consistent producers are those species which mature relatively early in the season or continue growth throughout the season whenever the conditions are favorable as is common with sedge. The two most consistent producers aside from this species are Bearded wheat and small blue bunchgrass. The remaining four species have a later growing period and their production is dependent to a great degree upon favorable summer conditions in addition to the spring influences. The two species of grama grass show an extreme variation in production of 100 per cent between 1927 and 1931, there having been no production of either species during the 1931 season. These two grasses are the most unreliable producers on this range, followed very closely by crowfoot. They are dependent for vigorous growth upon a combination of moisture and higher temperatures than prevail in the spring months. Favorable growing conditions occur largely in the summer months. This is especially characteristic of the two grama grasses. During a season of sufficient rainfall with accompanying high temperatures these species make a maximum growth. They start late in the season and make very little, if any, response to the early spring growing conditions which stimulate sedge, bearded wheat and small blue bunch grass to active growth.

It is apparent from the foregoing that from a production standpoint the grama grasses represent the most uncertain species of the principal grasses of the region, since they fail to produce, or produce lightly, during seasons when conditions are dry, and produce heavy growth when the other species also develop large crops.

Andropogon furcatus, which is commonly known as crowfoot,

*Used as basis for comparison.

(Continued on page 60)

"MINUTES COUNT"

By J. H. Hinman, '35

On the emergency ration bag in my kit were the words, "Minutes count, let's go." That is the creed regarding fires in the Forest Service.

All afternoon we had been having showers, snow, and hail, with a little lightning at times. The lightning had been hitting a ridge several miles away and I was watching pretty close for fires. At just six o'clock I noticed a wisp of smoke! It was only a matter of seconds before I had bearing, distance, and location on the fire report and was at the telephone.

"Hello! Hello! Ranger Station? Say, I've got a fire." Quickly I gave the location, then looked out of the window. "No, I can't see it now, it's hailing here like fury. What? Oh, I'll have to chase it. O. K. I'll be gone in a minute."

By seven minutes after six I was clambering over the cliff on the shortest route to the fire. The compass string hung around my neck with the compass banging against my chest inside my shirt. I sighted directly through a saddle in the range across the river and struck out. The hail storm whirled away and I saw it disappear over the far range of mountains. I was soaked to the skin before I had gone half a mile. Every tree was a veritable shower bath.

Over my shoulder the sun was dropping fast now. I increased my pace, "I've got to get over at least one of these ridges before dark," I thought.

Leaving the trail I splashed through the river and went up the other side. It was hard going. The rocks were loose and a lot of deadfalls made it worse, but at last I arrived, panting, at the top of the ridge. I jerked the compass out and backsighted at the lookout that stood high up against the skyline. In a moment I had got my bearings and started off again, with the sun only half an hour high behind me. Sliding and slipping down the mountainside I had reached the valley, waded the creek, and was clambering up the other side when the sun went down. By this time the pack was beginning to get heavy. I bounced it higher up on my back and hurried on. For a little way a game trail led in the direction I was going and I made good time. Then it swung away to one side and I was compelled to crash on through the timber. The light was about gone when I topped the next ridge. I wiped the sweat from my face and looked for the fire. Not a sign of a light could be seen.

"Probably put out by the rain," I said to myself and went on. By this time traveling was pretty difficult, I fell over logs and scooted down the muddy hillside, once stopping at the edge of a twenty-foot gorge by throwing both arms around a tree that grew at its brink. I turned the flashlight down into the blackness and swore, then turned and carefully made my way along

the side of the chasm until I found a big rock slide and scrambled down it.

Whenever I struck an open place I got my direction and went on, stumbling and groping until I struck the last valley that I would have to cross before climbing to the mountain top where the smoke had appeared. The whole side of the opposite mountain was visible but there was no sign of fire.

"The darned rain probably put it out five minutes after I saw it," I thought and went on.

"No use trying to go farther. My shins are skinned and I am all scratched up now from tumbling around in the dark. The woods are too wet to burn anyhow." Thus my thoughts ran until I found a rather sheltered spot at the foot of a cliff and threw down my pack. My watch told me it was midnight. In a few minutes I had a blaze going, then threw on bigger sticks until I had a cheery fire. My clothes steamed in the heat. While I faced the fire my back froze and when I turned around I froze on the other side. The nights are not very warm even in July, at an altitude of sixty-five hundred feet.

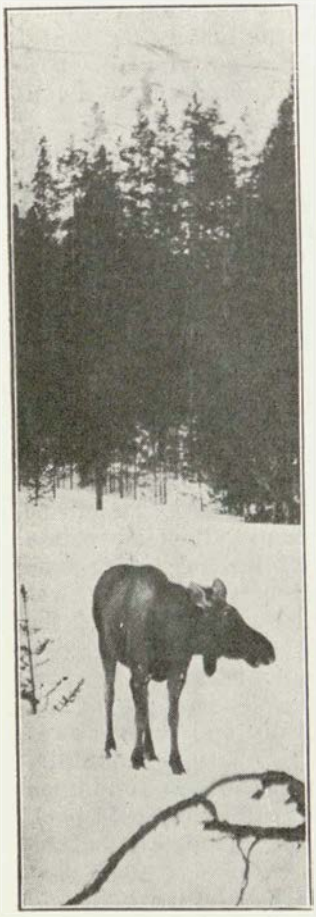
At four a. m. it began to get light so I ate some of my rations and started out. By six-thirty I topped the ridge, no fire to be seen. With the sunrise a brisk wind sprang up. I sat down in a sheltered spot to rest and a few minutes later got up to take another look around. There, not a quarter of a mile away, was the smoke. It was just an old snag struck by lightning and the breeze was fanning it into flames.

Two hours later the last spark was out and the ashes perfectly cold. I started back to the lookout. The weight of my pack had multiplied at least ten times and my feet seemed as if they had turned to lead. I picked my way down the mountainside and followed the creek out to the trail. Noon found me over half way home, sitting on a log by the trail eating cold pork and beans, raisins, and hard-tack. At three o'clock that afternoon the Ranger's phone rang.

"Hello," he said. "Oh, it's you. We had been wondering about you. I sent three other fellows after that smoke and they all came back this morning and said they couldn't find it. I'm glad you got it." And so I got my first fire for Uncle Sam.

GAME MANAGEMENT IN THE INLAND EMPIRE

By Glen A. Smith, Assistant Regional Forester, Region One



In the administration of the National Forests by the U. S. Forest Service, there came into recognition early in the history of that organization the fact that game was an important resource to be fully considered in the management of these vast, forested areas.

The thought that wild life, in the present stage of our country's social, economic, and industrial development, may be allowed to shift for itself was discarded at the outset.

We dropped from consideration, too, the "balance of nature" theory under which, in more primitive times, wild life could and did shift for itself and maintained its footing by species and numbers according to environment and adaptation. It was recognized that the earth has been so greatly modified by human action, that the so-called "balance of nature" has been very definitely and permanently disturbed. The approach, therefore, has been on the basis of checkmating these elements that nature once provided for.

The problem has been and is recognized as one of human thought and study, to be organized and administered as a part, and with the same earnest consideration as the growing and harvesting of trees, grass, and other products of forest or wild land.

There has been kept in mind, however, that the development of a wild life program must take cognizance of the many other pursuits of man.

There is ample justification for the thought that there may be localities where it would be unwise to urge the introduction or propagation of certain species of wild life and where, because of local conditions, it would be part of wisdom to drop them from consideration. For instance, it is obvious that serious consideration should not be given to the thought of returning the buffalo to his former range and in his former numbers and likewise, because of the migratory habits of elk and their destructiveness to agricultural crops, great care should be exercised in the introduction of this species of wild life into areas where the com-

munity life is dependent on agriculture and such allied interests as domestic livestock, horticulture, etc.

Study of the problems of big game in Region One of the U. S. Forest Service (which includes the National Forests of Montana and those north of the Salmon River in Idaho) has developed the fact that winter range is the one main problem of paramount importance. The former winter range of the elk, antelope, deer, and, yes, the mountain sheep was in the valleys, plains, and bad lands. The advance of settlement now very largely has taken over these feeding grounds and has forced these species of game to occupy areas not entirely their natural habitat. Furthermore, much of the National Forest area lies at relatively high elevations where winter conditions are severe, where deep snows are common, and where winter feed is limited to those areas or slopes blown blare or so situated as to get the full effect of the sun.

Summer range is abundant throughout the mountains, and considerable thought and study of the winter range problems have led the Forest Service to set aside and dedicate to winter use by game a large number of areas, aggregating more than one and a half million acres of the best and choicest winter ranges available within the confines of the National Forests.

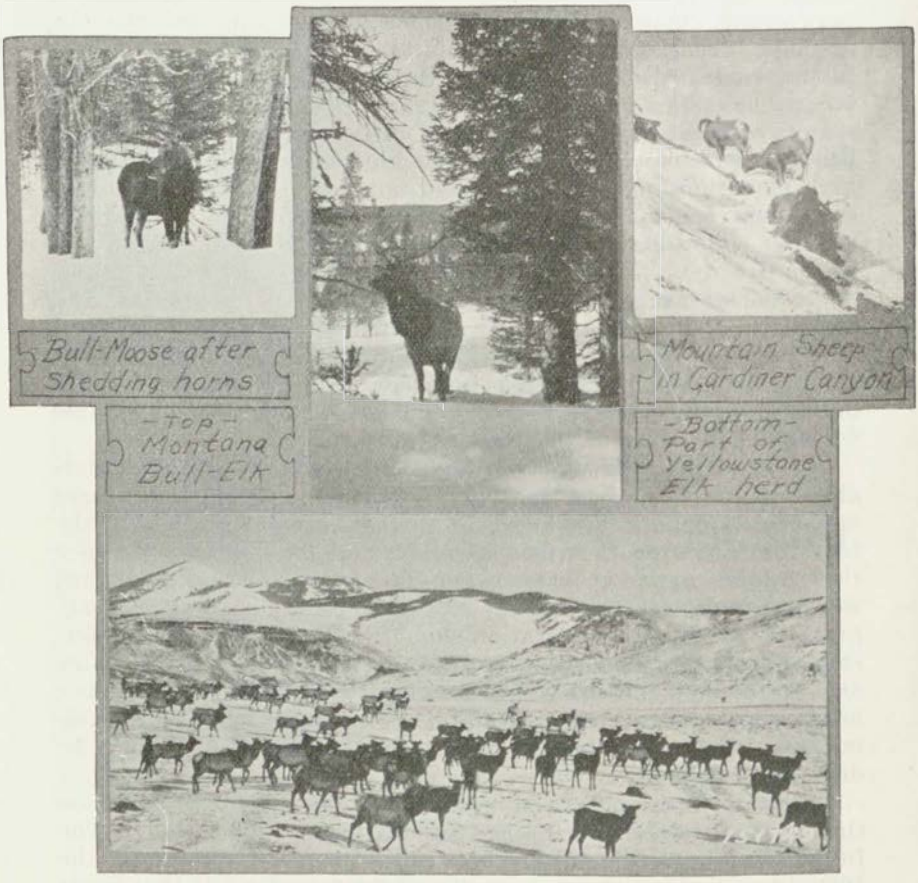
These studies have also brought out the fact that a considerable portion of the best and most important winter game ranges are located outside but adjacent to the National Forests in the foothills bordering the various valleys and that—by and large—these ranges are in private ownership. Also, if these important winter ranges are to be made available for game and properly protected, serious consideration should be given to public ownership of them. In general, these lands are of low commercial value and the owners thereof would be glad to be relieved of the tax burden, and in many cases would be willing to donate their holdings to the State if they were assured that the lands would be dedicated to game.

Elk and deer in both Montana and Idaho have increased on the National Forests during the past six years, 1925 to 1931. The following estimates are based on carefully made studies by the 160-odd rangers of their respective districts and while they must be considered as estimates only, they are believed to be fairly accurate.

	Deer	Elk	Moose	Mt. Sheep	Mt. Goat	Bears Black & Brown	Bears Grizzly
Montana	52,130	15,250	1,600	1,800	4,100	5,700	460
Idaho	21,000	5,700	290	100	1,580	2,300	50
Total	73,130	20,950	1,890	1,900	5,680	8,000	510

The net increase in deer in Idaho in the last six-year period is estimated to be 23 per cent; elk, 64 per cent. Moose, mountain sheep and goats are just holding their own. In Montana, during

the same period, deer have increased 34 per cent; elk, 52 per cent, while all other species are barely holding their ground. It is interesting to note that about 30 caribou are reported in the Yaak River and Pack River regions in northwestern Montana and northeastern Idaho, respectively.



The above increases are net; the utilization by man and the kill by predatory animals are important factors in limiting the increases of our game animals. To illustrate—In the National Forests of Northern Idaho the gross increase of deer and elk during the six-year period of 1925 to 1930 was 171 per cent, or 32,300 head of deer, and 125 per cent, or 4,800 head of elk. The average annual utilization of deer by man was 990 head, or 5,940 in six years, while the kill by predatory animals during the same period was 22,000 head, or 3,670 annually, or better than 3½ times that taken by hunters; while the annual utilization by man on elk for the same period was 280 head and the kill by predatory

animals was 123 per annum. The gross increase of deer and elk in the forests of Montana from 1925 to 1930 inclusive was—deer, 49,300, or 103 per cent; elk, 10,600, or 108 per cent. The average annual utilization of deer was 3,520, or 21,120 in the six years; while the kill by predatory animals averaged over the six-year period 3,775 annually, or a total of about 22,670 head. The average annual utilization of elk over the same six years—1925 to 1930—was 1,144, or a total of 6,867 head.

The concentration of hunters in certain areas is a matter that greatly influences the number of game animals in such areas. For instance, the Kootenai National Forest in Lincoln County has been considered for many years the best deer country in the entire Northwest, yet Forest Service estimates indicate a 7 per cent decrease in deer during the period 1925 to 1930 inclusive, and if we add the 1931 kill of approximately 2,000 head, the decrease in the deer population of that County will jump up to about 20 per cent in seven years. The Blackfoot Forest shows even a greater decrease, somewhere between 25 and 30 per cent, while all other Forests show increases. It is interesting to note that in all National Forests where the State laws permit the killing of bucks only, deer are making quite rapid increases—witness Beartooth net annual increase of 34 per cent, Absaroka 22 per cent, Gallatin 12 per cent, Jefferson 18 per cent, Helena 18 per cent, and Lewis and Clark 19 per cent.

A careful analysis of our supply of game and what is happening to it, and a survey of our game ranges indicate quite clearly a number of things that must be done. To my mind the following stand out: A review of the results of past methods of game administration in these western mountainous states will reveal the cold fact—that all methods so far tried have failed in general. They have failed because the foundation upon which they have been built is faulty. Bag limits, plus seasonal limits, plus game preserves, don't spell more game or a wise use of the game available, yet this briefly is the general trend of game management as practiced throughout these United States. Bag limits, plus limited annual kill, plus selective kill by sex, have a firm foundation and recognize natural and biological laws.

(1) The above data indicate the necessity for some method of gauging the utilization of our game in the various parts of the Region more in accord with the supply.

(2) It also shows quite pointedly that predatory animal control work must be given more attention to the end that the kill by predators will be brought to the minimum.

(3) Earnest consideration must be given to the matter of winter game range now in private ownership if adequate provisions are to be made for the maintenance of present numbers of elk and deer and for increases in their number.

Game is recognized as the property of the various states and

(Continued on page 61)

"Rimu" or Red Pine

Pure Beech Forest

THE FORESTS OF NEW ZEALAND

By F. E. Hutchinson, Professor of Forestry, Christchurch, New Zealand

In any account of the forests of a country as distant as New Zealand, it would probably be well to open with a few descriptive remarks on the climate and physiography of the land.

New Zealand is in total area somewhat smaller than the State of Montana, the figures being sixty-five million acres or, roughly, 100,000 square miles. This area is made up of two islands stretching over 1,000 miles from Lat. 35 degrees to 47 degrees south. The average width is about 100 miles, the greatest width only 200 miles and no point in the whole country more than 50 miles from the coast. Located in the roaring forties, far from any other land mass, the climate is distinctly oceanic, windy, changeable, but without great extremes of temperature. In topography, the South Island is more regular than the North. The long axis is northeast, lying right across the path of the northwest antitrades. The western coast begins with a narrow coastal plain, up to ten miles wide, of glacial moraine, densely forested, and having a rainfall of 100 to 200 inches a year. From this narrow plain the main range of the Southern Alps rises abruptly to a height of 10,000 to 12,000 feet, carrying perpetual snow, and a wonderful system of glaciers. East of this main range lies a belt of roughly fifty miles of high plateau deeply eroded, giving way to the eastern plains of alluvial formation, up to a maximum width of fifty miles to the eastern coast. The main range acts as a most effective barrier to the moisture laden westerlies, and the eastern portion of the island is comparatively dry. Every mile eastward has a marked effect. It is but 70 miles air line from a 200 inch plus rainfall on the main range to 23 inches in Christchurch on

the east coast. The native vegetation of the eastern plains and foothills is very similar to that of eastern Montana, a tussock grassland providing good sheep country.

The North Island is not so regular in feature, the mountain chains being lower, and discontinuous. In general, however, the western side has a heavy rainfall, and the eastern a low one. The island rises on both sides, from lowland clays and alluvial gravels to a 2,000 ft. plateau in the center of the island, culminating in a group of volcanic cones up to 9,000 feet high. Much of this plateau is covered with volcanic ejecta of extremely recent origin, geologically speaking. There are very extensive areas of pumice still covered only with a fern and scrub growth associated with only the poorest and rawest of soils. One volcano is still active, in a quiet way, while one has been quiescent only since 1886, when an eruption covered several square miles with mud and ash, and caused some loss of life. An extensive thermal district to the north of the volcanic peaks is on a much wider and diversified scale than Yellowstone Park.

At the time of European settlement, which began on a large scale only since 1840, over three-quarters of the country was in forest. The only considerable exceptions were the pumice regions of the central North Island, and the tussock grassland of the eastern side of the South Island. Since that time a great deal of clearing has been done, mainly to free the land for pastoral use, and secondarily for sawmilling. Settlement began at many points along the coast, and worked back inland. The lowlands of the North Island, covered with a very good stand of forest, proved also very fertile, and forest destruction far outran utilization. This phase of early development has now passed. The timber has a definite value, and in almost all cases is now milled prior to being opened for settlement. The chief forest areas now are on the central plateau of the North Island, and on the western and southern coasts of the South Island where excessive rainfall and poor soil have prevented settlement on a large scale. These areas are the centers of the present sawmilling industry.

The population is now one and one-half million, twice that of Montana. The country is engaged almost wholly in agricultural and pastoral production and consequent trading. Sheep and dairy-farming provide the chief exports. Though there are extensive coal measures, metals are wholly lacking, and little manufacturing is done other than the preparation of food products and similar raw materials for export.

The forest of New Zealand presents a mingling of two distinct streams, one of sub-tropical origin tracing back toward the East Indies, and the other of sub-Antarctic origin akin to the forests of southern Chile. This mingling gives rise to a great number of species in an extremely small area. Over 100 arborescent forms are to be found. The number of species is greatest in the far north, where a frost-free climate makes for abundant

representation of the tropical element, while the Fuegian element is here found occupying the higher levels, the differential being altitude. Coming south the number of species drops steadily as more and more of the sub-tropical representatives are eliminated. A considerable number are confined to the North Auckland peninsula. Many others stop at Cook Strait, which separates the two islands, while the lower altitudinal limit of the Fuegian group, typified by the Nothofagus genus, drops here to sea level. The South Island forests are therefore simpler in character than those of the North, though some of the most characteristic trees of sub-tropical origin still persist right to the southern-most extremity of the country.

Although the number of conifer species is less than a dozen, while the remainder are hardwoods, yet the conifers form the dominant element in the stands in all parts of the country having a rainfall of over 50 inches and an elevation below roughly 2,000 feet. That is, the whole of the lowland commercial types is coniferous except on the eastern or dry fringe of the South Island where pure stands of Nothofagus or southern beech occur.

Most of these conifers are members of the Podocarpaceae, a southern hemisphere sub-tropical family akin to the yew of the northern hemisphere, with berry-like seeds, and scale leaves. The genera Podocarpus, Dacrydium, and Phyllocladus are represented by several species each, including large trees of commercial value. Two species of Libocedrus and the renowned kauri, Agathis australis, complete the list of conifers. In spite of the large number of hardwoods, they are not of great importance. Only the beech forms pure type stands on the mountain ranges and in the drier areas. Elsewhere the forest contains a top tier of tall commercial conifers with two or three undertiers of shorter and usually non-commercial hardwoods, extremely numerous, with a ground tier of shrubs, ferns, etc., on a soil covered with a deep layer of rotting vegetation. Epiphytes and lianes are common, the whole making an extremely dense and impenetrable forest of the jungle type, though free from all animal life, from reptiles or disease-breeding insects.

The chief types recognized are: The kauri forest, confined to the northern third of the North Island, and now almost a thing of the past. Here the dominant species in the kauri, Agathis australis, growing to immense size—diameters up to 22 feet by up to 100 feet of clean cylindrical bole, surmounted by a spreading crown. The kauri is found usually in clumps and groves, interspersed by hardwood species, and by the podocarp species, so that in spite of the large trees the average stand per acre is not great. The kauri bush, being in the north, contains the greatest wealth of species, and the most luxuriant growth of ground-tier, epiphytes and lianes. Logging commenced in the kauri forests before 1800, this timber providing New Zealand's first export. Water transport was used extensively and at one time

reached large proportions. Kauri now exists only in inaccessible places and the few remaining operations on the mainland have less than five years' life ahead.

The rest of the North Island is occupied by the mixed podocarp type, where the dominant species is rimu, (Dacrydium cupressinum) with kahikatea (Podocarpus dacrydioides), totara (P. totara) and matai (P. spicatus) occurring in mixture with a great number of hardwoods, mainly non-commercial in character. The best stands of this type were to be found on the coastal flats and lower river valleys, and were destroyed early in the history of the country. The stands at present being worked are at from one to two thousand feet altitude on the central plateau. Here rumi forms 80 to 90 per cent of the milling stand, the other three species being found in small proportion. The average stand per acre is 8 to 12 thousand feet of large trees, up to 8 feet in diameter, short boled, and scatteringly distributed over very broken country so that logging is difficult and costly.

In the South Island the drier or eastern valleys are occupied by the Nothofagus forests. Five species are recognized forming mainly pure stands differentiated by soil moisture and other site factors, but rather unusual in that there exists but the one canopy, the beech forests having no subordinate associates as have the podocarp types. The ground is relatively bare, dry, hard, and open, and a distinct fire hazard exists in this type in dry summers. On the western coast, with its heavy rainfall are two podocarp types—pure kahikatea in the swamps and river flats, and pure rimu on the morainic terraces. The former is being rapidly cut out, both as the more valuable timber, and as occupying potential dairy land. The rimu forest is by far the more extensive in area, and growing on a most hopeless soil, agriculturally, was not freeholded extensively by the early settlers. Large compact blocks of relatively easy topography were still intact when the large scale reservation of State Forests was made in 1921. On these glacial terraces, also, the rimu type seems to reach its best development. The trees are small—very few above 3 feet and none above 5 feet D. B. H., but tall, with clean straight barrels, growing in stands of fairly high density. The average yield is something like 20 thousand per acre, with many areas carrying up to 60 thousand. Here also young trees of all sizes are very common, and regeneration becomes established fairly easily, in striking contrast to the North Island plateau where the stands are all overmature with a striking absence of all forms of young growth. The number of hardwood associates is much fewer here in Westland (South Island) and the "weed tree" problem is not acute. Of all the native types, this rimu type in Westland offers the greatest incentive to forest management. It has not yet been attempted, though some initial research has been carried out.

Farther south still, at the southern end of the South Island,

is found a mixed type in which the Nothofagus characteristic of the eastern side mingles with the rimu characteristic of the west, in a forest where the beech is the dominant and seemingly the more aggressive component, seeding up in great profusion on areas that escape slash fires.

Commercially speaking, the rimu is the mainstay of New Zealand's production, forming over 60 per cent of the cut, the balance being kahikatea and other conifers, except for about 8 per cent of hardwoods, most of which is beech. The beech forests form by far the greatest per cent of our present forest area, but much of it comprises stands of small trees high up on steep country, definitely non-commercial. It is only in the southern district of the South Island that extensive milling of beech is carried out. The demand for hardwood is not great. In a growing and predominantly rural country softwood forms the great bulk of the consumption, naturally, though the beech is used on a small scale for motor bodies, brush ware, implements, etc., being similar in appearance and properties to the American birch. The hardwoods other than beech are little used. They are mainly small and crooked, difficult to season, or lacking in any special technical properties. Small size rules out a number of otherwise very good timbers, and the whole of our use of structural hardwoods is imported from Australia. In return New Zealand sends to that country about an equal quantity of rimu, kahikatea and kauri for general and special purposes, Australia being markedly deficient in softwoods.

Rimu is the standard general purpose timber of New Zealand, because it is the most plentiful softwood. It is not an ideal general timber, however, being markedly harder, heavier and stiffer than the pines. It is extremely even in texture, and possesses considerable beauty of figure so that it is greatly used for panelling, furniture, etc., making up in a large measure for our lack of decorative hardwoods. For joinery purposes, however, it is not relished due to its high hygroscopic value, and for this purpose Douglas fir, redwood and western red cedar are used, imported from the United States and Canada. In spite of fairly extensive forests, therefore, the country is an importing one. The exports to Australia balance the hardwood imports in quantity, but by no means in value, while the imports from North America are not reciprocated at all, a matter to which considerable prominence is given in discussions on tariffs and trade agreements.

Business may have taken a slump but it didn't seem to affect these fellows—Jensen, Whitaker, Love, Renshaw, Robertson, Davis, Beechel, Jacobson, Lewellyn, Stevens and Hinman and some say that there are a few brave boys left yet.

NATIVE WOODS FOR FUEL

By Ernest E. Hubert, Professor of Forestry, Idaho

It is not generally known that the native Montana wood species compare very favorably with coal in heating value, but the following data collected from various sources indicate this to be true.

The average heating value of dry wood is about 8,030 British thermal units per pound, as compared to 12,040 per pound for coal. In general, two pounds of dry wood give off as much heat as one pound of good coal. One cord of the heavier woods such as maple and hickory, or two cords of cedar, spruce, cottonwood, and other light woods equal in heat value one ton of coal.

Douglas fir, western larch and ponderosa pine, commonly known as western yellow or bull pine, are good fuel woods. They give off intense heat but vary in such quantities as ignition, uniform burning and rapid burning. The pine varieties, such as ponderosa, burn more rapidly but give off a quicker, hotter fire. Woods like Douglas fir and larch burn more slowly but hold fire longer. Woods containing resin or oil are proportionately better. Dense pines containing 30 per cent resin, for example, have a relative fuel value considerably above that of hickory.

Moisture content, weight, amount of oils and resins and special uses for which heat is required should all be carefully considered when judging fuel values of various woods. The dry weights of various woods per given volume give a good indication of their relative values for fuel. Equal weights of the same woods containing no oils or resins give off about the same amount of heat when burned. A hundred pounds of dry cottonwood should give as much heat as a hundred pounds of dry hickory. Heavy wood will average 4,000 pounds per cord of 80 cubic feet; medium, 3,000; light, 2,000. Part of the aversion to the use of wood as fuel is due to the fact that the wood is not properly seasoned. Green wood, besides being harder to ignite, is from 5 to 25 per cent less valuable for heating purposes than dry wood. Green wood is also heavier to handle, for nearly a thousand pounds of moisture is lost from a cord of green wood during seasoning.

The relative fuel values of various woods **per unit volume** when dry are listed in the following list of averages: hickories, 100; birch, 87; ponderosa pine (10 per cent resin), 84; mountain ash, 80; larch (tamarack), 76; Douglas fir, 65; western hemlock, 61; lodgepole pine, 58; white pine, 56; aspen, 56; white fir, 55; spruce, 52; cottonwood, 50; alpine fir, 48.

The fuel value of wood is often rated lower than it should be on account of the method used in burning it. The stove or furnace, to give the greatest heat, should be kept filled with closely packed wood and the drafts carefully regulated. By removing the grate bars of a coal furnice and laying fire brick on the floor of the ash pit, and by tightly closing the ash pit door and open-

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SOME HIGHLIGHTS ON A FORESTRY TRIP

By F. G. Clark, Associate Professor of Forestry

Teachers of forestry, like other common mortals, are inclined to get into ruts. To get "into a rut" means that one has gotten out of contact and is so far behind he progress that is being made that he sometimes imagines that he is one of the leaders instead of an out of date follower. Traveling about, meeting people, and seeing things is a sure cure for this disease. One can't help but absorb some of the progress that is being made, and obtains a measuring stick by this means to compare his own progress and position as well as the progress and position of others.

It was with this in mind that last summer, 1931, I decided to see how others were conducting their affairs and how much progress had been made. I was especially interested in matters pertaining to forest finance, which is synonimous of forest business. It required 14,000 miles of hard driving (all east of the Mississippi River) to get a glimpse of forest business in the various forest regions of the Eatern United States and Canada. As expected, I found that a great deal of the worthwhile progress has not found its way into print. The people that are responsible for it are so busy doing things, they have little time to write about them.

In the Lake States region it was interesting to see the prophecy of Filibert Roth coming true—concerning the increasing economic value of the lowly jack pine. Before the days of Kraft paper, Roth said, "Don't be alarmed over that so-called weed tree the jack pine. Some day that now worthless fellow will become a respected citizen in the forest community." It has come to pass. Jack pine brings in a stumpage of from $1.50 to $2.00 per cord and occasionally more and is being managed for a sustained yield, as the Kraft paper concerns build up holdings around their mills to assure themselves a perpetual supply of raw material.

In such cases, forestry must be a paying proposition or it wouldn't be practiced by industry—and this in the North where the average yield on the best sites is from twenty to twenty-five cords of wood in forty years. (This is discounting the "forty cords in forty years" propaganda of the foresters who are advocating that all forest land be made to grow timber. These fellows are doing more harm to the cause of forestry than they are good.) The Lake States have more than twenty millions of acres of denuded forest land—and I presume that the game is to get as many of them back into forestry as possible. This is a wild scheme and basically, economically unsound. Much of this land has at present no economic value of any kind. A goodly share of it must of necessity become a State "public domain" of waste land. The major portion of it has a herbaceous cover of some kind so there is little danger of shifting soil. Some of this has been planted at a cost of as much as $13.00 per acre with a low

percentage of success. One forester made the statement that during the drought of the past few years a large percentage of the plantations had died, trees up to twelve feet in height being killed. The returns from this land will not pay the cost of reforesting, even at public expense.

However, other uses are being made of it even in its present denuded condition. Recreation is the principal one. Some counties in this region secure the greater share of their tax revenue from creational development. Roscommon County in Michigan, for example, secures much of its revenue from summer homes built around two of the largest lakes. Nevertheless recreation is having a very good effect in stimulating the activities of the various Eastern States in matters pertaining to forestry, New York being the leader with its twenty million dollar program of land acquisition for State forests and parks. This is for a combined use, recreation and timber products.

Every forester, if possible, visits the Madison Products Laboratory. This is worth anyone's time. Among the other things of interest was the effort that was being made to find a use for lignin. This varies from 400 to 600 pounds per ton of dry wood, and in the sulphite process of pulp making now runs off with the liquor from the digesters. In the dry kiln, they were seasoning, under the expert supervision of H. D. Tieman, 4x12 clear black walnut deals. At the time of the inspection they had been in the dry kiln three months. The job was about half finished. Since then I have learned it was completed without a single check developing in any of the pieces. This I understand is an outstanding achievement in kiln drying of lumber.

The outstanding impression that I received from my visit to the laboratory was that the process of forestry seems to be more dependent on the chemical engineer than on the forester, that the trend is toward a cellulose industry rather than wood, and that in the future the profession will be somewhat on the order of a partnership affair between the industrial chemist and the forester. The former will supply the technique of new uses and the latter will supply the raw materials and the mechanics of cheap production.

The chief item of interest at the treating plant at Galesburg, Illinois, aside from its probably being the largest plant in the world, was the lap welding of all the seams on the retorts so they could be covered with insulating material. One welder was making a double weld of three feet per day. The object of the welding was to cut the cost of fuel in heating the retorts. Riveted joints cannot be covered due to leaks developing, which necessitate the removal of the insulating material for repairs.

The new era of transportation methods in forestry is noticeable throughout the East—that of the motor truck. Light trucks capable of speed up to fifty miles per hour and a capacity of two

(Continued on page 66)

WHY WE STUDY FORESTRY

Editorial Comment

and

School Notes

THE EDITOR'S PAGE

The Montana School of Forestry is year by year gaining a more widespread reputation. Ideally situated in the heart of the Rocky Mountains and the timber country, it has made the most of its opportunities and has profited thereby. Total registration in the school amounted to an almost unheard of figure throughout 1931-1932. From the beginning of the fall quarter through spring quarter registration more than 140 men have registered in the School of Forestry, many of them coming from other states and two from other countries. Because of the very large number of applications for entrance received, the University found it necessary to raise the requirements for entrance to the School of Forestry applicable to out-of-state students. In spite of the restriction, our enrollment mounted to almost fifty per cent more than the designated maximum. Students in the School of Forestry are more than proud of the school they attend.

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Depression hit the School of Forestry in a round-about way during the winter quarter, when the announcement was received from the Civil Service Commission that no junior forester and junior range examiner examinations would be given this year, in that the waiting list would more than take care of possible vacancies. With the announcement, senior prospects did not look of the best and it hit the boys pretty hard. However, they snapped out of it, and life at the school has gone on much as in former years.

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With the end of this school year in sight, most of the boys have located jobs and will leave the campus till another time. Some may never come back; others we will see in the Library next year. It makes us think of the years we have spent on the campus, and of the men who have been here four, perhaps more, years and will not come back after graduation in June. Like ships that cast anchor in the harbor only a short time and then pass on to other waters, students come, stay for a while and then go out into the field for which they are prepared. We must say good-bye when they leave, and so it is we bid the best of luck to our seniors this year as they leave the School of Forestry for their chance at success.

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In parting, the editors of the 1932 Forestry Kaimin wish to thank those who have given us their cooperation on this issue, particularly those who helped when for a while it looked as though the Kaimin must be abandoned until another year. To the men whose articles are printed on its pages, to the advertisers who materially helped in its publication, to the faculty of the School of Forestry and to the many who offered helpful suggestions, the editors extend their hands.

FORESTRY CLUB

By Walt Pool, '33

Eighteen years of successful organization is now the record of the Forestry Club. Each of these years has seen a group of men, coming from nearly every state in the Union, enter the Forestry Club and each year has seen a like group leave the club to scatter to the four corners of the earth. The Forest School directory furnishes sufficient material to tell just where these men go and how they are scattered. These men bring in many new ideas, exchange them in the club, and take different viewpoints with them when they leave.

The object of the Forestry Club is to further the interests of forestry in the University of Montana through the creation of opportunities for the exchange of views in forestry and its allied subjects, to disseminate knowledge of the purpose of forestry, its ideals and its achievements, and to promote the spirit of goodfellowship among its members. The members of the club are students from the four classes and faculty members. The Forestry Club serves as a common meeting ground for these groups where everyone attains the same level.

By touching the high spots of the year it is easy to see that the club is upholding its standards and obtaining its objectives.

Dad DeJarnette was present at the first meeting of the club this year to give us all a hearty welcome. Dad is a charter member of the club and every fall, since the organization of the club in 1914, has been here to greet both the old and new members.

Some of the events which were continued by the club this year, and which have nearly become traditions with the organization, are the annual Fall Hike on October 17, the Fall Dance on November 25 and the Forester's Ball on February 5. Although the boys were handicapped in the work on the ball this year it was again declared the best dance on the campus. Plans are now under way for a spring hike which will serve as a farewell to the seniors. Joint meetings with the Home Economics

Club and the Press Club were scattered throughout the year. This year another attempt was made at moving a large fir tree from Pattee Canyon to the Kirkwood Memorial Grove. Under the careful direction of Gene Fobes the prospects of attaining favorable results from this experiment look pretty good.

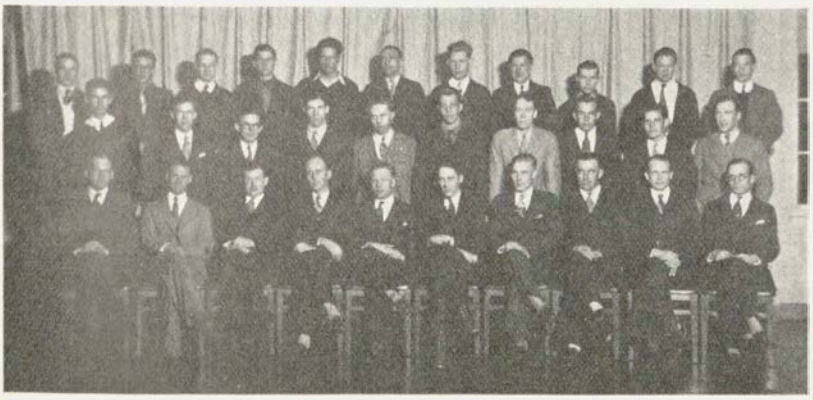
Some changes in the administration of the club have been adopted this year. A set of regulations governing the Forestry Club Loan Fund have been drawn up and accepted. The constitution of the club has been revised to the effect that the new officers are elected so as to take office at the first meeting of the spring quarter.

Upon several occasions the club has been favored with talks from various Forest Service men. Among the men who have kindly offered these talks are Mr. Gisborne of the Experiment Station; Mr. Bradner, head of the Office of Forest Products; and K. D. Swan, Forest Service photographer, who displayed many interesting pictures. Paul Fair showed his pictures on Montana Wild Life. Other talks and pictures relating to forestry in its various branches were given by other Forest Service men and alumni of the school.

With these various activities of the club it is easy for the reader to see just what is going on in our school outside of the daily scholastic routine.

What Do You Think?

Without any reason, they open the season
On mallards and bluebills and teal.
With guns and equipment, we might get a shipment
To send to our friends for a meal.
I wish the commission of huntin' and fishin'
Would broaden a bit its decree.
Not ducks would I go for, but boy I'd give dough for
My limit in profs, don't you see?



THE MONTANA DRUIDS

By Robert Cooney, '32

The Druids may count this past year as one of the most successful in the history of the organization. The membership was exceptionally large.

Meetings were held at the homes of some of the professors, also at various times during the year groups of the members got together and entertained the organization at fraternity houses or private homes.

The Druids were very fortunate in having Dr. Schenck back with them again during the winter quarter. His enthusiasm and charming personality has been an inspiration to every member. All felt a deep regret that he could not have remained longer.

Under the capable leadership of Stanford Larson the organization has lived up to the purposes and ideals for which it was founded. Namely, it has backed the Forestry Club in all its achievements, has formed a common meeting ground for students and professors where problems pertaining to school and forestry have been discussed. Above all it has stood, as it has from the beginning, a lasting link between the Forestry School and the men who have gone out to follow the profession toward which we as student foresters strive.

Apologies to Joyce Kilmer

I think that I shall never see
A D as lovely as a B,
A B whose rounded form is pressed
Upon the records of the blessed.
A D comes easily—and yet
It isn't easy to forget
D's are made by fools like me
But only God can make a B.

SPRING PICNIC, 1931

By John Shields, '32

Forester's luck held out again for this event. In spite of dire weather forecasts from the usual crepe hangers this Sunday turned out to be one of those spring days which the Booster Club Bulletins tell about. The wind had been blowing its worst down the Hellgate for two weeks preceding, and it was with some trepidation that the committee in charge, composed of Shields, Murchie, Evenson, and Coon, set the date for April 26. Some preliminary scouting revealed the ideal spot on the bluff across the river from Milltown. A long, gently rolling meadow, sloping to the north and terminating in a cliff overhanging the river at the Montana Power company's dam gave a view up and down the river for miles.

The proceedings started the night of April 25, when pits for the barbecue were dug, the grounds cleaned up, and a log was cut for the log rolling contest. The pond for this contest was found at the foot of the cliff, where water had collected in a pocket along the railroad tracks. The bean hole was also dug, and the beans in a large crock were put to bed for the night under a blanket of hot coals.

Next morning, under the direction of Dad DeJarnette, the crew started the fire in the barbecue pit, and the work of making the final preparations began with a bang.

A rifle range was constructed; logs were piled up to make a backstop for a baseball diamond; wood was gathered for the big campfire in the evening; pegs for the horseshoe tournament were driven; and drinking water was hauled in milk cans from Deer Creek, and distributed at strategic points in man pack water bags.

At three-thirty the crowd began to arrive, some of them in their own cars, but most of them in the two large busses which were chartered for the occasion. The busses stopped at the foot of the hill leaving about a quarter of a mile hike for the passengers, who, by the time they reached the picnic grounds, were ready to sit down and enjoy the scenery through one of the three transits which were set up on top of the bluff.

Soon some of the folks demanded action—and got it. The boys who had been longing for the first swim of the year soon found the log pond. The water looked pretty cold, but memories of the old swimming hole were too strong for a few of them, and they were glad that the logs served as an excuse to fall into the water. They were all equally bad at riding the logs, so neither a first nor a last prize could be given. However, Bob Cooney and Chuck O'Neil easily walked away with the honors for swimming, and Archie Murchie took the prize for the fastest runner in a warming up contest after the swim was over. Walt Pool received acclaim as the most prudent man by producing a pair of dry

pants which he exchanged for his wet ones in the privacy of the Milwaukee tunnel.

In the mean time those who felt that their swimming could be postponed for awhile found entertainment up above on the bluff.

Two baseball games, in which the girls as well as the boys took part, were soon going in full swing. Over near the barbecue pit the horse shoes were flying thick and fast; and Marion McCarty at the rifle range was doing a rushing business.

Here something new in the form of a rifle match was introduced and proved quite popular. Each man and his girl were allowed five shots apiece at a regulation indoor target. The winners were the couple whose score was the highest. Bob Cooney and company took the prize with a score of 86.

A contest to guess the correct age of a tree was conducted by Stan Larson. After each person had recorded his or her guess on a slip of paper, Stan bored into the tree with an increment borer, counted the rings, and announced that Faithe Shaw had guessed it right at thirty-five years. The prize was the core from the tree enclosed in a glass tube.

By this time frequent cries of "When do we eat?" were heard, and Dad DeJarnette and his crew were ready for them. The barbecued meat was sliced; the baked spuds were dug up; and the beans were lifted from their nest. Buns which had been prepared previously, pickles, furnished by Mrs. DeJarnette, and apples completed the meal.

When the cooks cried, "Come and get it," luckily no one was killed in the rush, and the line which formed looked a mile long to those on the serving end. Everyone had plenty, though, and there was a decided tendency to take it easy after the meal. The campfire was started and the day ended with songs and stories led by Blarney Love.

The busses were due to leave at nine-fifteen, so about nine o'clock the crowd started walking down the hill, the fires were put out, the equipment was gathered up, and the spring picnic was over for another year.

This Happened to Fay Clark Last Fall

THE JUNIOR SPRING TRIP

By William Ibenthal, '32

A procession of good cars, poor cars, fast cars and slow cars loaded with rootin' tootin' students left Missoula. Swan Lake was the destination. Every vehicle covered the intervening miles in due time, one load much delayed, another's occupants choked with dust lifted by the wildcat pranks of the car ahead but everyone more than willing to "help themselves" at the Larson table. The Larsons proved admirable hosts to this group of holidaying students.

Swan Lake is a pond of delightful contour. Miles of shore line nestled between two great ranges of hills gave the student party more than they expected in boating, fishing and hiking expeditions.

The classes at Swan Lake were the best ever. Lessons in silviculture were brought home by visiting and enjoying all the timber types adjacent to the lake. One day's trip into Glacier Park was well spent from a standpoint of studying timber types as well as seeing the grandeur of the Continental Back Bone.

The days at the camp paid big dividends in play as well as in study. Fishing was good. We have to hand it to Prof. Skeels for catching the best fish of the week. There were plenty of boats for all the boys. Water fights, log rolling contests and fishing expeditions filled every evening. There were two outstanding events of the week. The one was the sending of Evans Hawes' disreputable hat to a watery grave in the river. The other was the riding of an old raft down the Swan river. It was a good ride and no one as much as got wet.

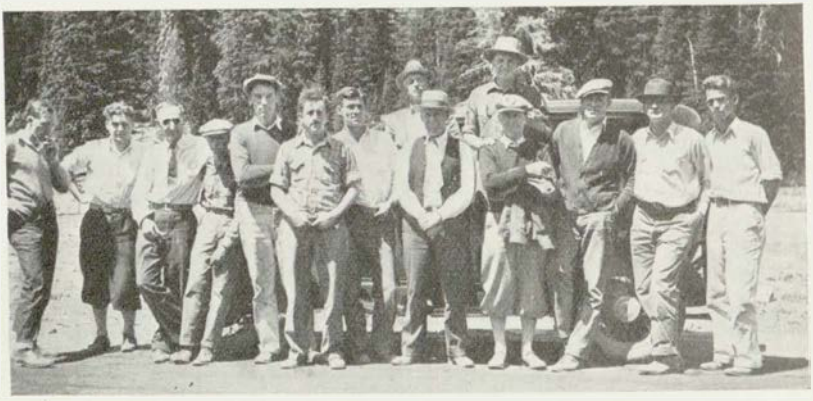
Bear hunting and sight seeing hikes up to the divide between the Swan and the South Fork of the Flathead yielded no bear but they gave that satisfaction always seemingly worth while of looking down on a big patch of wilderness cut up by rocky canyons and unknown creeks.

Too soon the week was up and we headed for home.

JUST IMAGINE

By All of Us

Centerwall.....Getting an "A" from the Dean
Holgren.....Proposing in the Dean's Office
Dobrinz.....Talking without his hands
Ibenthal.....Without something relative
Love.....Paying a poll tax
O'Neil.....Getting a date the first time he asked for it
Guntermann.....Taking the same girl out twice
Fobes.....Without a proposition
Brooks.....Acting as a gentleman
Nugent.....Without a brief case
Spaulding.....Being kicked out of school his last quarter
The Dean.....With his hair combed
Mary Wilson.....Turning library fines in at the business office
Welton.....Without an argument
Lantz.....Missing a sorority dance
Neff.....As a chorus girl
White.....Docking lambs
Davis.....Pushing a baby carriage
Beechel.....Giving his tenants a piano
Cooney.....As a dinner guest of a house mother
Flint.....With a hair cut
Frykman.....Without a girl
Hawes.....Playing Sir Walter Raleigh
Calkins.....And his "Systematic Girl"
Lawrence.....Telling parlor stories
Larson.....In a hurry
Brown.....Having a nervous breakdown
McDaniels.....Cutting his foot with an axe
Murchie.....Producing harmony
Shields.....With hair like Jensen's
Jensen.....Being polite to White
Whitaker.....Being false to Lulu
McCarty.....In old clothes
Bob Matsen.....With an intelligent expression
Pool.....As Dean Janitor
Hoye.....At the D. G. house
Frankel.....Eating pork chops
Irish.....Not in a good humor
Cook.....Winning a wrestling match from his son
Skeels.....Refusing to sign a note
Benson.....Making an eight o'clock
Faunce.....Not studying
Shea.....Having a care
Curtiss.....Being allowed in the Forest School again
Kipp.....Going to a dance sober
Miller.....With a new hat



SENIOR SPRING TRIP

By John Curtis (Journalism '33)

"Son," says the Dean to me, "how would you like to go on the annual romp of the Forest School seniors? Take in a few parks, big mountains and such, and go down where the trees grow big?"

"Ulp, ulp," I comes back in a snappy manner. Who wouldn't want to go on a trip like that? The person who turned that down would be a good case for a psychopathic ward. So, with a feeling of uncertainty as to how a lamb-like printer's devil would fare with 14 disciples of the great god Bunyan, I was among those present when the second annual senior expedition left Missoula bright and early May 16. My job was to let the local papers in on the story of the field trip, keep the Kaimin informed as the tour progressed and help protect Cap Calkins from Walker and Redding.

Faculty members who were in charge of the trip were Professor J. H. Ramskill, who led the group through the Idaho-Washington district; Dean Thomas C. Spaulding, who asssumed the leadership with the party's arrival in Oregon and who directed the tour from there until the return stop at Spokane; and Professor Ross Williams, a Forest School graduate who last year substituted for Fay Clark. Other members of the party were Carl Walker, Hugh Redding, Ray Calkins, Bill Brown, Dave Tucker, Archie Murchie, Kenneth Beechel, Charles Rector, Howard Smith, Jack Sadasuk, Eugene Oren and myself. Two large sedans and two new Chevrolet trucks carried the members of the party and all baggage.

The first night was spent at the forestry experiment station north of Priest River, Idaho, where John Thompson, a graduate with the class of 1926, was director. An inspection of the Great Northern's wood-treating plant at Hillyard featured the Spokane stop-over. From Spokane, the caravan proceeded (despite a swell Palouse dust storm) to Seattle, which was reached in plenty

of time for the fellows to start doing the town and exploiting the wholesale houses. (Here, Archie Murchie purchased one pneumatic mattress and one of those fluffy bed-bags—you couldn't get him out of bed from Seattle on!) The huge Weyerhaeuser mills at Everett, the pulp and veneer plants and a shingle factory at Tacoma occupied the next two days.

Enroute from Tacoma to Longview, a side-trip was made a few miles into Mt. Rainier National Park, where several hours were devoted to exercising the leg and neck muscles (the latter in a vain attempt to locate the elusive peak—however, hours later along the road, we did see it, when we chanced to look back).

Barkes Adams, '28, worked overtime the legs which used to carry him around Dornblaser field, when he conducted the group through the big three-unit mill of the Weyerhaeusers at Longview. From Longview to Portland and from there to Roseburg, wonderful weather favored us as we travelled through the beautiful Oregon country. Sunday morning, a few miles out of Roseburg, we struck the Redwood Highway and obtained there what was—to many of us—our first glimpse of the Pacific ocean. For more than 100 miles from Bandon to Crescent City, California, we travelled the beautiful highway, keeping the ocean in sight almost continually.

In northern California, we travelled through one of Nature's most wonderful bits of handiwork—the shaded, cathedral-like forest of redwoods which inspired the works of Peter B. Kyne. Two days were given to inspections of the mills and logging operations of the Pacific Logging company.

From Eureka, where we spent two nights, the trail proceeded to swing back northward. At Willows, California, there were enough palms that the gang might pose in affluent, Native-Son fashion, before their vest-pocket cameras. Next came Klamath Falls, Oregon, Klamath Agency—where Floyd Phillips joined the crowd and went with us up to Crater Lake and finally, Bend, Oregon, where we spent our last night in that state.

Late in the afternoon of May 30, having crossed south-central Washington in weather that made us feel like explorers of the African veldt, we drove up from Cheney and struck the road where we had turned westward to Seattle, nearly two weeks before. Next morning, the entire party, with the exception of Rector and Tucker who had gone to work in the Southland, piled in and started for Missoula, which we reached just in time for dinner. We had been gone 16 days and had travelled more than 3,360 miles according to the Dean's speedometer.

"This year's tour was a tremendous success," said the Dean to me when I was writing the last story.

"And how!" said I. And if seeing new and interesting things, learning lots, and having a swell time with a great bunch make a trip successful, that was one for the book with four stars.

THE FALL HIKE

By Bruce Centerwall, '32

"Hey! You can't park there! You've gotta leave room for Jack Shields to get thru there with the big truck and the grub!" Such was the greeting that came to many of the drivers who were trying to find a place to park their cars up Marshall Gulch on the night of October 17, the night of the annual Forester's Fall Hike.

The welcoming speech of President Shields was given to about 100 couples who were gathered around the large fire at the picnic grounds. This was followed by a couple of stories, told in true western style by Walt Pool.

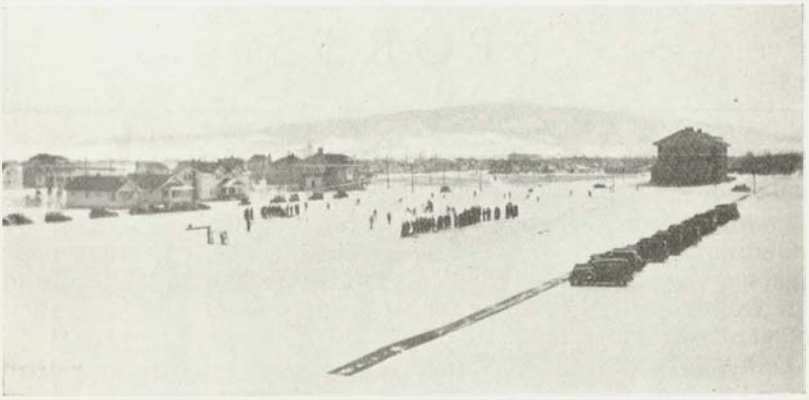
Marion McCarty produced a ukulele, and after much coaxing, some of the fairer members of the crowd joined the boys in a few songs. Following the singing, Earl Welton recited a few poems and Stan Larson told some stories. K. D. Flock expressed the feeling of the alumni by saying that they always enjoyed the hike.

Following a short talk by Dr. Waters, the contests were started. Roy Halvorson proved his ability with the spurs by defeating a picked field of four in the tree climbing contest. Rufus Hall, last year's champ, gave Roy a hard run for the money.

In the log sawing contest Al Spaulding and Stan Larson proved they were better gyppos than Dick Whitaker and Ken Beechel when they cut their log in record time. Incidentally, the only reason that they won was that Woolfolk and Centerwall, last year's winners, didn't enter the contest due to the fact that Centerwall was in charge of the entire affair.

Joel Frykman, who claims to have helped Paul Bunyan log the Lake States, made the chips fly when he successfully defended his title as the best axe-man of the school.

About that time Joe Wagner, our chief cook, yelled, "Come and get it." After a hearty lunch of hot dogs, coffee, cider, apples and doughnuts the crowd enjoyed a general "session." With the satisfaction of having attended another successful hike everyone returned home to await another such opportunity.



THE SKATING RINK

By Millard Evenson, '33

Some five years ago a group of Montana freshmen attempted to build an ice skating rink for the benefit of the student body during the winter months. After the failure of this attempt no further effort was made until this year when the Foresters took the matter in hand and made a rink that was a rink.

The R. O. T. C. parade ground was appropriated and by the use of the new Sixty Cat an area approximately 250 feet by 550 feet was cleared. When finally a sufficient layer of ice was formed over this area it provided excellent skating from November 18 until about the middle of February. All construction work was done by Forest School students and later on the maintenance was done by Perry Sparks, assistant of the University maintenance department.

With the creation of this rink came the organization of a hockey team which was composed entirely of Forest School students. This team was very successful against other University teams but failed to come through with the goods when matched against outside semi-professional teams.

The continuance of this project in future years promises the rise of hockey as a major campus sport.

Radical Bill Ibenthal: Intelligent conversation is nothing but high powered B. S.

SPORTS

By Oliver Hoye, '32

This year, in spite of heavy scholastic requirements, the Forest School students took a very active part in University athletics.

In football Chalmer Lyman was one of Montana's most outstanding ends. He earned a letter this year and has two more years of varsity competition. L. Bohlander and L. Anderson of the freshman class were out for freshman football and made their numerals in that sport.

Lyman also made his letter playing on the varsity basketball squad and was a consistent scorer throughout the season.

Al Flint and Al Spaulding, lettermen of last year, made a good showing in track. Others who were out for the squad were Charles O'Neil and Jack White. Lewis McDaniels turned out with the freshman squad and earned his numeral in the pole vault.

In the intra-mural basketball tournament the Forest school team composed of White (captain), Flint, Hancock, Hawes, Hessel, Renshaw, Chapin, Halvorson, Welton, and Roffler made a very good showing.

Benson, Brooks, and Myers were victorious in their wrestling matches during the "M" Club tournament. Benson and Myers upheld the Grizzly reputation in the Minor Sports meet at Bozeman.

The intra-mural swimming meet was held February 24 in which Harrison took first in the 40-yard and second in the 100-yard races. Barker took second in the 220-yard race with Cooney coming in for a third. L. Landall won the plunge for distance. Hoye won the 100-yard backstroke race and set up a new intercollegiate record in that event.

In the swimming meet with the State College at Bozeman, Cooney took first in the 100-yard breast stroke. Hoye won the 100-yard backstroke but was disqualified in the event. O'Neil came in for an easy third in that race.

This year the Foresters organized a hockey team composed of Goodacre, Hawes, Hoye, Dobrinz, Murchie, Hague, Quinlin, Lawrence, Evenson, Shields, and Brooks. Since most of the men were comparatively new at the game and had not played with the others before, the team only won one out of three games played. The boys showed a lot of enthusiasm for this sport and it is hoped that in the near future hockey will become one of the most popular sports on the campus.

The Iron Duke: You'd better get'er and get'er cold, too.

RIFLE CLUB

Marion McCarty, '33

The Rifle Club opened up again this year with the same pep and enthusiasm that characterized the meetings of the previous year. Nearly all the old members were back ready to knock the black out. In addition, there were quite a few new faces around, enough so that two firing nights were necessary.

The club turned out regularly throughout the fall and winter quarters for the .22 rifle practice in the indoor range located in the Chamber of Commerce building. During the spring quarter, firing was mainly outdoors with .30's.

Under the expert coaching of Captain Rogers the club progressed in marksmanship and general knowledge concerning handling of fire-arms and their care. The old stand-bys still head the list of marksmen, but several new men were outstanding in their group.

During the winter quarter a match was held with the Forest Service team made up of experienced men with newer members also. Although lacking experience in competitive shoots, the school pushed the old-timers till the very last stage, only to lose by a total of 35 points. The match consisted of three stages, prone and sitting, kneeling, and the last, standing.

Hawes, Fobes, Shields, Beechel, Guntermann, Matsen, Rauma, Bauer, McCarty, and Landall represented the school, Landall being the outstanding man for the entire match.

The season was entirely successful in accomplishing our object, although we did not compete with outside clubs as much as desired, due to lack of time and regular studies.

Beechel (to Lawrence who is playing tiddliewinks in Dendro class): What's the score?

Lawrence: Nothing; I'm a Grizzly.

THE FORESTER'S BALL

Joel Frykman, '33

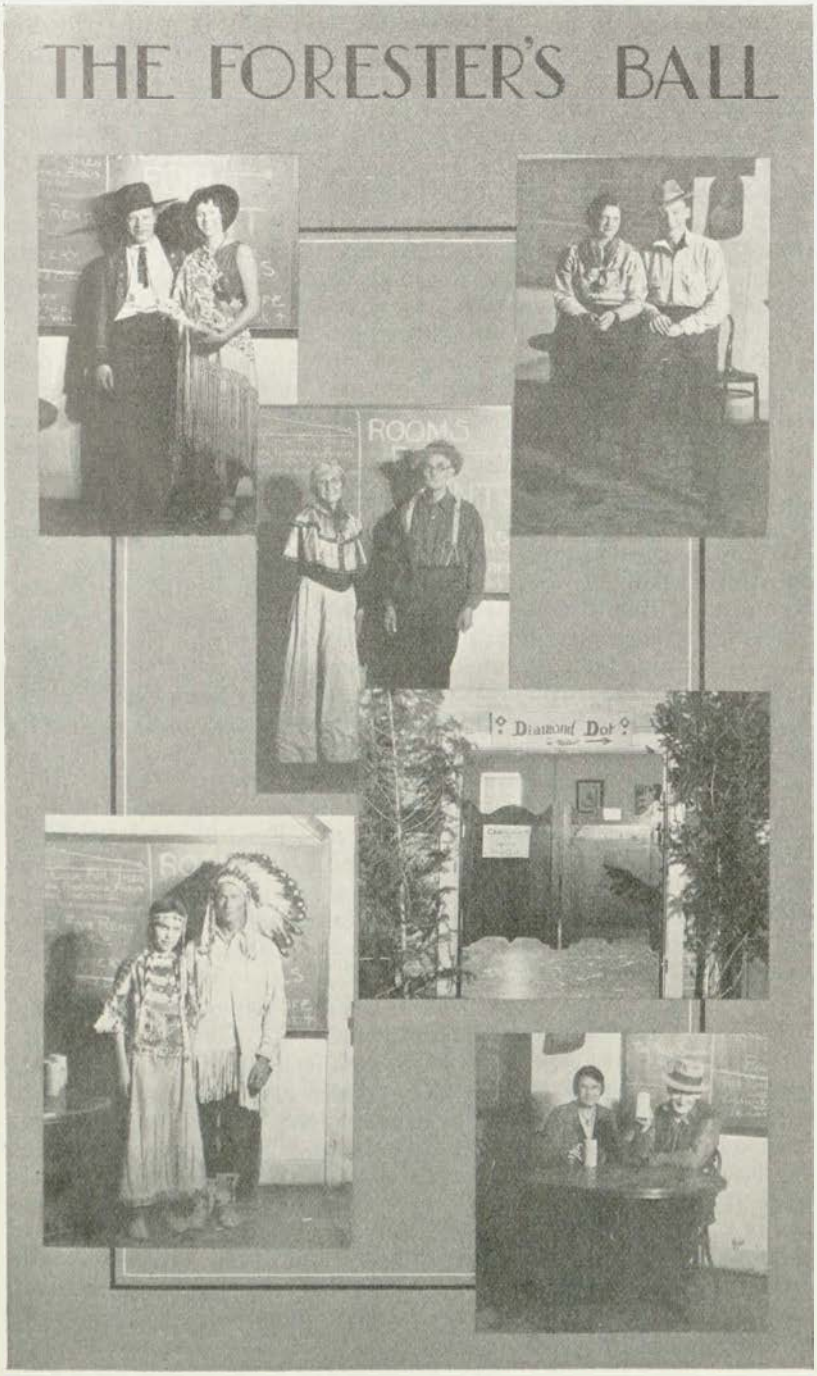
Following in the footsteps of Paul and his Blue Ox, a happy crowd of his worshippers and guests sought the doorway of the Men's Gymnasium on the night of February 5. That they were happy, carefree and exuberant is not to be wondered at for this was the night of the annual Foresters' Ball, a gala occasion at any time and the biggest on the campus. Each person as he entered the gym passed through a bough-covered chute where each received his programs. All were branded in order that none might go astray, nor strangers enter.

The big gym, appropriately decorated in the resemblance of a forest with fir trees set about the walls and arranged in a circular row about the floor, with the upper balcony topped off with cedar boughs for the ceiling, presented a beautiful view to the awe-stricken guests. Passing through this border of trees into the canopied forest amphitheater, each guest was greeted from across the floor by the brobdingnagian Paul. Nearby and to the left stood Paul's Babe, the Blue Ox, a creature of huge dimensions. In order that no one might be lost in the merry-making, a section corner, duly surveyed, of section 37, had been established in the center of the floor. Likewise other landmarks had been established for the guests' meeting places, such as the Diamond Dot hitching rack and a log trailing chute.

To show how well Paul provided for every comfort of his guests, one of his best timbered forties was moved into a side room, and nothing loath at doing his best, he brought in the moon and several stars to shine in a deep blue sky. Of course, he took a forty with a gushing spring, and then built a campfire for those who wished to gaze and dream. He called it the Ranger's Dream. If rangers have dreams like that, who wouldn't want to be a ranger?

And for those who felt a need of refreshing draughts and a desire to caress the footrail, the Diamond Dot saloon beckoned with a cheery light. There the young and thirsty might gaze through and drink of amber liquids—cider and near beer—and be refreshed. The old timber, in a reminiscent mood, might shove aside the swinging doors and passing through to the bar, familiarly tap the footrail and, leaning elbows on the polished bar, order from the white-aproned bartender, his favorite varnish remover and in realism of setting, at least, feel his reminiscences repaid.

Paul, certain to get the best music for his fun-loving guests, had Sheridan's 8-piece orchestra produce the sort of rhythmic syncopation that made dancing a pleasure of gliding movement. Each dance was announced by a small replica of the Babe, pulling a load of logs across the ceiling on a high-lead system. In order to give added effect, a locomotive bell, bull fiddle and a triangle were used to announce each change with plenty of noise.


THE FORESTER'S BALL
ROOMS
Diamond Dot

Having made sure of every comfort and pleasure for his guests, Paul invited all to his cook shack in the forestry building and spread before them a great repast. No darkies on bacon rinds greased griddles, nor were beans served from shotguns, nor coffee from fire hose, but everything was put on in a big way. Speaking of darkies, Paul had Duffy's Funmakers add to the merriment and enjoyment of all in the cook shack.

This affair of Paul's was put on through the able assistance and supervision of Chief Push Al Spaulding. Paul in choosing his Push had a contest, the one who could spit tobacco juice the farthest and truest winning. Al won by a couple of hairs and Paul was well satisfied. Paul had several contests on this order for the rest of the members of the committee. A knock-kneed person who could hang onto girders would be put on the bow committee; a bow-legged person who could ride a barrel, would be put on the bar committee; cross-eyed persons who could see two ways might be put on police duty, and anyone who liked to sit in a hammock and gaze at stars would be put on the Ranger's Dream committee. Millard Evenson and Stanford Larson were assistant pushes, having ranked next in the contest with Al. The remaining members of the committee were: Property, Walter Pool and Wilbur Chapin (which meant the driving of a rickety, wobbling, coughing, snorting, bucking Ford truck about town and the campus looking for all equipment they could beg, borrow or buy); finance, Lawrence Neff and Joel Frykman; tickets and programs, Eugene Fobes and Howard Coon; music and entertainment, Iver Love and Jerome Frankel; walking bosses, William Ibenthal and Joe Woolfolk (big shots); transporation, John Shields; printing and signs, Charles O'Neil and Jack White; electrical experts, Raymond Calkins and Fred Benson; boughs, Chandler Jensen and Edward Dobrinz; refreshments, Robert Cooney, Robert Holgren and Joe Wagner; decorations, Al Flint and Dick Whitaker; music, Bruce Centerwall and Oliver Hoye, and Ranger's Dream, Evans Hawes and Mark Lawrence. All members of the Forestry Club assisted.

The tickets were made of wood-grained paper, having printed upon them the emblem of the Forestry Club. The favors, rather unique, were made from juniper wood by sawing off discs from 2-inch poles. The bark was left on and each disc was polished in order to show the beautiful grain of the wood. One side was stamped with a drawing of Paul Bunyan. The programs featured the names of various characters of Paul Bunyan lore in the names of each dance. Boughs and trees used were obtained as usual in the Hayes Creek and Pattee Canyon areas. A great deal of enjoyment was gotten out of these trips. Up Pattee Canyon snowball fights were indulged in for exercise, and a few black eyes more or less from snowballs only added to the hilarity.

A new advertising scheme was tried this year with much success. The Club obtained the use of the high wheels belonging

to the Polleys Lumber Company. This was loaded with three yellow pine logs and then pulled about the campus and town with a caterpillar. It evoked considerable interest since few people have seen these wheels before.

Prizes were given again this year for the best Western costumes worn at the ball. There were many good costumes there.

It is only through the generous cooperation of the University authorities, professors of the Forestry School, members of the Forestry Club and the good management of those in charge that the ball can be put on with the success and credit to the organization which it brings. It is with this background that we look forward to assurance of success in the future when putting on bigger and better balls.

LABOR COST SURVEY OF FORESTERS BALL, 1932

By Stanford Larson, '32

Wage Scale:

Foremen ..... 50c per hour
Labor (Common) ..... 40c per hour

Activity—	Man-Hours	Cost
Cedar Boughs	120	$ 50.60
Trees (Pattee Canyon)	454	189.70
Tickets	9	4.50
Programs	20	10.00
Favors	120	55.80
Decorations	706	300.20
Bar	76	33.60
Property	64	32.00
Eats	301	125.10
Signs	139	67.60
General	300	150.00
Totals	2,309	$1,019.10

This classification includes preparatory work by committee heads, finance committee, Kaimin publicity and advertising.

"LONGING"

By Mark Lawrence, '33

Oh, I am a Clearwater lookout
With the world of trees below.
The looming crags of the Selway,
The peaks of the far St. Joe
Give this life its touch of grandeur
That many lookouts know.

But oft it's a lonely grandeur
That reflects with their shining snow
And it sets your heart alonging
For some sweet girl you know,
And you'd like to grab your packsack
And down the long trail go.

1932 TRACTOR SCHOOL

By I. W. Cook, Professor of Forestry Engineering

The fourth annual tractor school was held in cooperation with the Westmont Tractor and Equipment Company of Missoula on February 29 and March 1 at the Forest School building. This was the most successful school held both in point of attendance and interest.

The total registration was two hundred and fifty. About eighty loggers, farmers and government engineers and highway contractors were from out of town, the remainder included Forest School students, Smith Hughes high school students and local residents.

Mr. Goss, manager of the Caterpillar Tractor Schools, was in charge of instruction. He was assisted by William Wagner, chief logging engineer, and Wade Goodman, district manager for the Caterpillar Tractor Company.

The first day was devoted to instruction in the use and application of tractor power to farms and highway construction. Instruction the second day was given on tractor logging, tractor maintenance and the Diesel engine. All instruction was especially shaped to apply to local problems and conditions.

Instruction was in the form of lectures, movies, talking pictures, and open discussion. The local dealers, Roy Robinson and Bill Gallagher, and their salesmen and service men were available at all times to answer personal questions. Their display room was open and available for demonstration at all times.

The growth and success of our tractor schools warrants their continuation.

Cook: You can't sleep in my class.
Flint: I know it. I've been trying for half an hour.

Ed: What do you think of my new shoes?
Bill: Immense.

"LONELY NIGHTS"

By Victor Miller, '35

Have you ever taken a midnight stroll
A singin' or whistlin' a tune
Stoppin' on some soft grassy knoll
To talk to the man in the moon?
It doesn't matter where you are
Any place will do,
For the sighin' breeze and the swayin' trees
Will always talk to you.

Out on the prairie that same old moon
Will shed a mellow light,
And the cool night breeze will hum a croon
As it bids your camp goodnight.
Those twinklin' stars that hang so low
Are just the right refrain
For the yappin' howl of the coyote song
Echoin' back again.

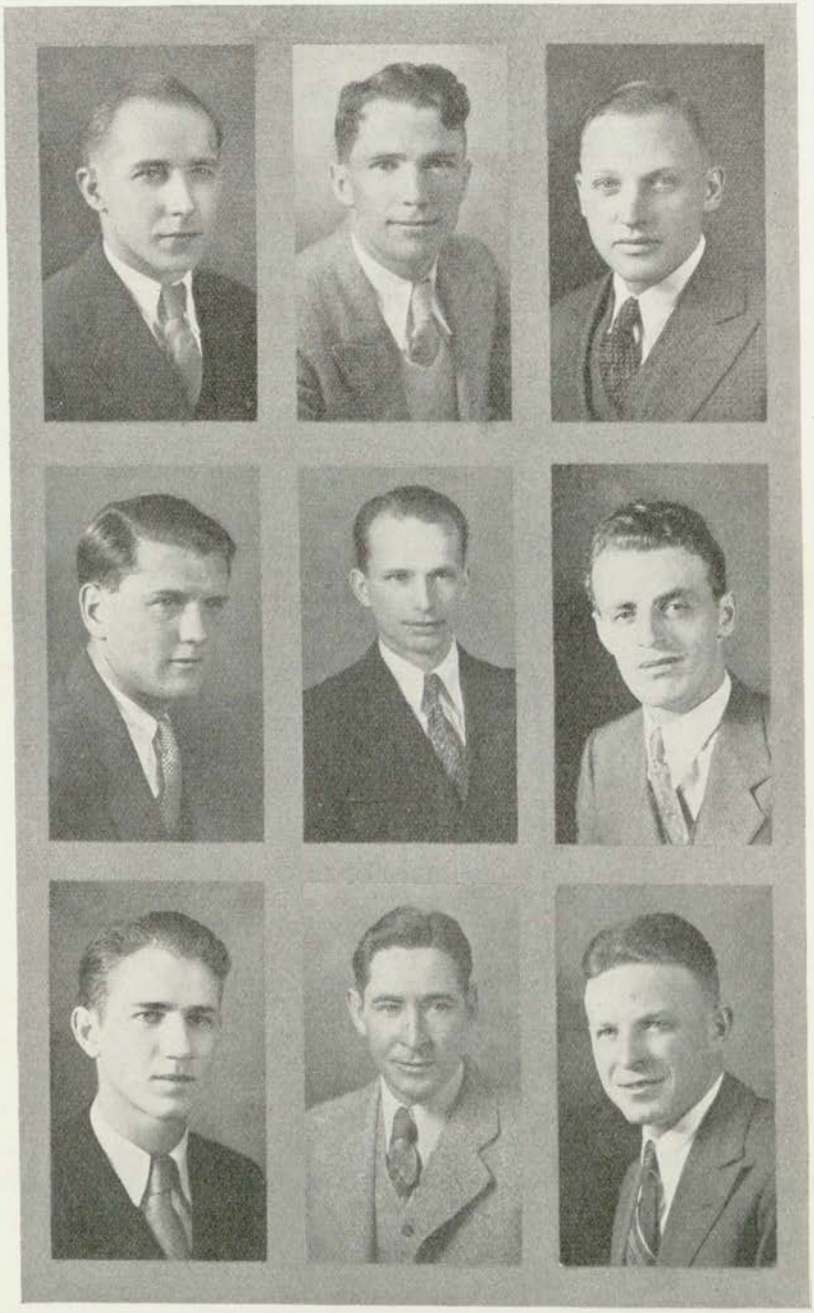
Shadows play on canyon walls
Mid mountains cool and still,
Yet the nectar of that sharp thin air
Gives way to a pleasant chill.
Ghostly forms of trees and rocks
Are escorted by eerie light
Of that same old moon that calls so soft
"Oh swaying pines, goodnight."

There is peace and quiet and solitude
In a beautiful lonely night
With no one there but the friendly moon
To greet your weary sight.
It doesn't matter where you are
Any place will do,
For the sighin' breeze and swayin' trees
Will always talk to you.

Fay Clark recalls the good old days of being an English baron. Those were the days!

Clark (during the children's hour in Forest Management, while Hawes and Renshaw are having fun): Well, what's the joke?

Renshaw: I'm sitting by it.



Larson
Hoye
O'Neil

Cooney
Stillings
Young

Beechel
Love
Ibenthal

SENIORS

KENNETH BEECHEL, "*Zek*," Oregon, Wisconsin—Forestry; Phi Sigma 4, 5; Forestry Club 3, 4, 5; Druids 4, 5; Wesley Club; Glee Club 3, 4; Forestry Kaimin Bus. Mgr. 4, Editor-in-Chief 5; Chairman of Forester's Hike 4; Forester's Ball, Tickets and Programs 4; Student Assistant Dendrology 4, 5; Rifle Club 3, 4, 5. Transfer from the University of Wisconsin.

BRUCE CENTERWALL, "*Center*," Crystal Bay, Minnesota—Forestry; Sigma Phi Epsilon; Forestry Club 1, 2, 3, 4; Druids 4; Ball Committee 4; Forestry Club Basketball and Baseball 1, 2, 3, 4; in charge of Fall Hike 4. Bruce chased smoke on the Condon District, Flathead National Forest, last summer.

WILBUR CHAPIN, "*Bill*," Hamilton, Montana—Forestry; Forestry Club 1, 2, 3, 4; Druids 3, 4; Ball Committee 2, 3, 4; Forestry basketball 2, 3, 4; Forestry Club Executive Board 2; Rifle Club 1, 2, 3, 4; Spring Hike Committee 2. The last two seasons Bill has been traversing trails on the Bitter Root Forest.

ROBERT F. COONEY, "*Bob*," Canyon Ferry, Montana—Forestry; Sigma Alpha Epsilon; Forestry Club 1, 2, 3, 4; Druids 2, 3, 4; President 3; Ball Committee 2, 3, 4; Forestry Kaimin 2; Forestry Club Cook 1; Silent Sentinel 4; Senior Representative to Central Board 4; Swimming team 1, 2, 3, 4; Captain 3; Swimming instructor 3, 4. Bob is the best natured fellow in school. During the summer vacation period he has been a Forest Guard on the Nelson Ranger District, Helena National Forest.

ALFRED A. FLINT, "*Al*," Philipsburg, Montana—Forestry; Sigma Alpha Epsilon; Forestry Club 1, 2, 3, 4; Druids 2, 3, 4; Ball Committee 2, 3, 4; Track 1, 2, 3, 4. While Al Spaulding tops the hurdles, Al Flint hurtles through space in the broad jump. Al has worked on Fire Survey on the Cabinet National Forest for three years.

EUGENE W. FOBES, "*Gene*," Pasadena, California—Transfer from Pasadena Junior College; Forestry; Forestry Club 2, 3, Vice-President 4; Druids 3, 4; Phi Sigma 3, 4; Rifle Club 3, 4; Editor Forestry Kaimin 3; Ball Committee 3, 4; Honor Roll. Gene's specialty is trail traversing, having been a foreman on the Blackfoot National Forest for two years.

WILLIAM F. GUNTERMANN, "*Cal*," Santa Barbara, California—Besides being a member of the Forestry Club since 1927, Cal found some time to serve as President of the International Club during his last year. Druids 3, 4; Rifle Club; Ball Committee. During the summer months Cal puts in his time as foreman of traverse or mapping crews. He worked on the Cabinet National Forest in 1931.

EVANS C. HAWES, "*Ev*," New Bedford, Massachusetts—Forestry; Forestry Club 1, 2, 3, 4; Rifle Club 1, 2; Secretary-Treasurer 3, 4; Druids 2, 3, 4; Correspondence Secretary 4; Ad-

vanced Army 2, 3; Forestry Kaimin 3, 4; Forestry basketball 1, 2, 3, 4; Hockey Team 4. Last season Evans was mapping in Yellowstone National Park. Heels click when Lieutenant Hawes barks orders in spring drill on the R. O. T. C. field.

OLIVER HOYE, "*Hooey*," Chisholm, Minnesota—Forestry; Sigma Alpha Epsilon; Forestry Club 2, 3, 4; Druids 3, 4; Ball Committee 4; Swimming team 2, 3, 4; Forestry Club Hockey team, Captain, 4. Oliver is a transfer from Hibbing Junior College, Minnesota. Montana Intercollegiate backstroke champ. Employed last summer on the Blackfoot National Forest.

WILLIAM A. IBENTHAL, "*Willy*," Middleton, Wisconsin—Forestry; Forestry Club 1, 2, 3, 4; President 4; Druids 3, 4; Ball Committee 2, 3, 4; Executive Board of Forestry Club 1, 4. Bill almost has a white collar job with the Office of Forest Products in Missoula in the summer and whenever he can spare the time from school in the winter months.

STANFORD HUGO LARSON, "*Bull Pine*," Missoula, Montana—Forestry; Forestry Club 1, 2, 3, 4; Druids 3, 4, President 4; Forestry Kaimin 3; Swimming team 2, 3; Ball Committee 2, 3, 4; Phi Sigma 3, 4; Fall Hike Committee 3. Stan has been an alternate ranger for the past four years on the St. Joe National Forest and can easily fill a ranger's shoes.

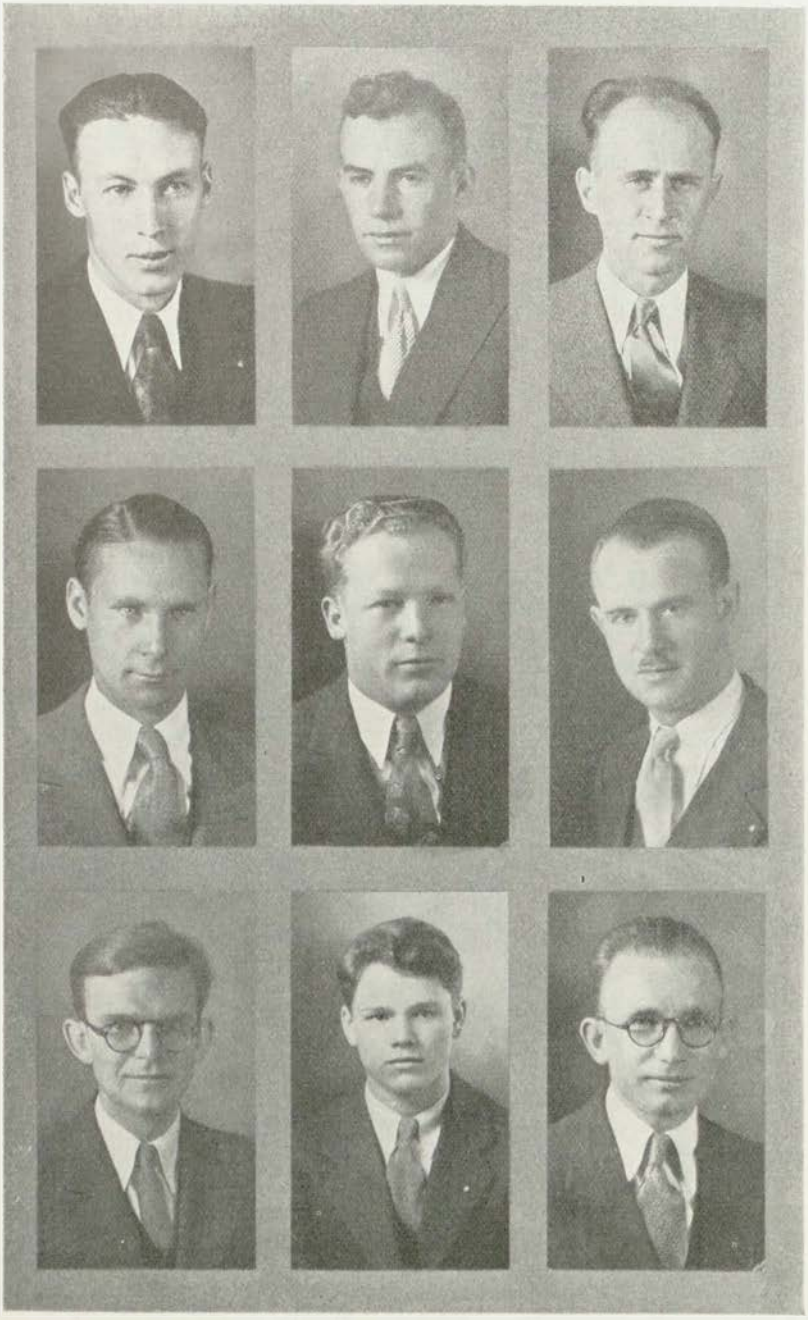
IVER B. LOVE, "*Blarney*," Missoula, Montana—Forestry; Forestry Club 1, 2, 3, 4; Ball Committee 1, 2, 3, 4; Druids 3, 4; Forestry basketball 2; Forestry Club Executive Board 3; Fall Hike 2, 3. Transfer Montana Normal College (Div.) Lewistown. Blarney was chief of a trail traverse party for two years and last year trail crew foreman on the St. Joe National Forest. Blarney starts the singing on the fall hikes. Wonder who will take his place next fall?

CHARLES O'NEIL, "*Chuck*," Pomona, California—Forestry; Sigma Alpha Epsilon; Forestry Club 1, 2, 3, 4; Druids 3, 4; Track 2, 3, 4; Swimming team 3, 4; Rifle Club 3. Chuck has chased smoke, pulled ribes for the Blister Rust people and was with the O'Neil Lumber Co. at Kalispell last summer.

JAMES RENSHAW, "*Jimmy*," Missoula, Montana—Forestry; Forestry Club 3, 4; Forestry Club basketball and baseball 3, 4. Jimmy is a transfer from North Carolina State College. Last summer he worked on the Selway National Forest.

JOHN SHIELDS, "*Jack*," Butte, Montana—Forestry; Forestry Club 1, 2, 3, President 4; Druids 3, 4; Rifle Club 1, 2 3 4. Jack is the official truck driver this year. He has had a world of experience in the field. Last summer Jack was a foreman of a topographic surveying crew on the Flathead National Forest. Jack transferred from the School of Mines in Butte.

ALFRED E. SPAULDING, "*Al*," Missoula, Montana—Forestry; Sigma Phi Epsilon; Forestry Club 1, 2, 3, 4; Silent Sentinel



Spaulding
Hawes
Chapin

Flint
Fobes
Renshaw

Shields
Centerwall
Guntermann

4; Phi Sigma 3, 4; Druids 3, 4, Vice-President 4; Ball Committee 2, 3, Chief Push 4; Track team 2, 3, 4; "M" Club 2, 3, 4; Forestry Kaimin 3; Honor Roll. Al has been an alternate ranger for the past three years on the Bismark District of the Kaniksu National Forest and is rated by his Supervisor as the best temporary employee on the entire forest.

WARREN H. STILLINGS, "*Stilly*," Missoula, Montana—Forestry; Forestry Club 1, 2, 3, 4; Druids 3, 4; Ball Committee 3, 4; Phi Sigma 3, 4; Rifle Club 2, 3, 4; Phi Sigma Kappa 3, 4. Warren has been a lookout on the Bismark District of the Kaniksu National Forest for the past three seasons.

EDWIN JOSEPH WOOLFOLK, "*Joe*," Mona, Wyoming—Forestry; Sigma Phi Epsilon; Forestry Club 1, 2, 3, 4; Druids 2, 3, 4; Ball Committee 2, 3, 4; Forestry Kaimin 3, Managing Editor 4; Loan Fund Committee 3, 4; Manager of Minor Sports 4. "Gentleman Joe" and also a crack scholar. Transfer from Black Hills Teachers' College, Spearfish, South Dakota. Headquarters smokechaser and mapper on the Bismark District for the past two years.

ALFRED E. YOUNG, "*Earl*," Chattaroy, Washington—Forestry; Forestry Club 2, 3, 4; Phi Sigma 3, 4. Transfer from Washington State College in 1929. Earl did grazing reconnaisance work in Region 1 in '29 and '30 and was with the N. P. Timber Survey and Land Classification crews in '31.

Guntermann, upon hearing that there would be another 8th grade arithmetic test in management, got himself a date with an 8th grade teacher. Incidentally, Cal got a passing mark in management.

We would like to see Ed Dobrinz try the "Flying Dutchman" on that burro that he likes to talk about in bull sessions.

Among the new officers of the Druids two grads came through with flying colors:

Chet Jackson—Janitor.

Hugh Redding—Keeper of the Bees.

A forest school relic was lost when Hawes' hat was sent to the bottom of Swan river.

Snap Shots

"Dead Eye Zek" "Scarface" "Poker Face Joe"
Ed."

"Deer Huntin'" "Idaho Smudge"

"Advertizing the Ball" "Rough Rims"

B-u-r-r-r-u-m-m

THE NEWCOMER IN THE FOREST SERVICE

(Continued from page 8)

worked side by side over these years, enjoying the same treatment—the job suffering in the meantime and the taxpayer footing the bill, paying for work, good and poor, in equal compensation.

Unless an officer became morally delinquent and his conduct attracted public notice, his risks of uninterrupted employment were small indeed.

The passing of the years shed much of the romance and glamor of the pioneer ranger's job. As time slipped by and free and easy methods gradually vanished, many secrets of the job's basic requirements were revealed. During this period many men fell by the wayside as the gap between requirements and performance spread and as the spreads were identified.

Those who kept pace with growing demands and remained with the Forest Service found ever new and growing satisfaction in helping to forge the links of administration into a more substantial chain.

As more years swept by, experience expanded. Substantial foundations were laid upon which to plan orderly for and build sounder administrative practices. Policy statements covering this and that were currently enunciated and recorded. The humble Use Book grew into a fat and pretentious volume. Manuals of procedure were issued. Many publications dealing with technique of forest activities found their way to the desks and libraries of individual Forest officers. Standards and measures were established. Range appraisal and timber appraisal methods were devised and revised. Job analysis and job specifications became live, useful, functioning figures in the scheme of administration. Fire planning and programs of work covering many activities were born and ever since have been currently made more effective.

These progressive steps point to the fact that administration in the Forest Service gradually found itself. Not entirely perfected, to be sure. Far from it! But nevertheless, administration has built for itself a fairly sound structure. The time of hit and miss accomplishments has passed. Today the Forest Service is obligated to meet specific demands. It is held to account for achievements, or lack of them, by a fairly well informed public. It can meet these demands only through orderly procedure and the functioning of a well qualified body of personnel.

It can no longer afford to depend upon chance nor to educate men from the ground up, nor give time to "making men" after the period has passed within which they have had the opportunity and the time to make themselves.

Now to the newcomers.

First, ninety-nine chances out of one hundred, he is not a newcomer after all. Most likely he has worked for two or three

years as lookout, scaler, range assistant or assistant ranger. Moreover, the great probabilities are that he has enjoyed the tremendous advantage of an education in an accredited forest school. If so, he has already profited much by the administrative experience of the Forest Service, the curricula of the forest schools in no small part having been built up around this experience.

The newcomer, so-called, steps into a well defined class of work, the demands of which are real and urgent, but none the less interesting. It calls for the display of high grade ingenuity, initiative and skill. Almost daily it throws out new challenges that only top-notchers can hope to meet. It clamors for accomplishment on carefully devised specifications and within well defined limitations of time.

Ranger Newcomer finds close guidance in his job at the hands of experienced forest officers. He is furnished with a well appointed supply of tools, provided at Uncle Sam's expense. His everyday work features more or less an organized training course. He has authoritative volumes about him for consultation and study. And lastly, he enters the service at a generous salary, with expenses paid away from headquarters. He becomes a member of a going concern with definite obligations to meet.

Obviously, the public has a perfectly sound justification for expecting from this man an entirely different standard of performance, both quantitatively and qualitatively measured, than from the ranger of former years who, practically without assistance and guidance, proceeded to do what he could for a miserably low rate of compensation on a job that was new to all.

In view of this changed order of affairs, the probationary period within which every man entering the field work of the Forest Service serves for a year, has come to be in practice what the Civil Service Commission has always intended that it should be; namely, a specifically stated time for genuinely testing a newcomer's fitness for public work in the Forest Service. It is his opportunity to prove his adaptability and qualifications for the job, which by the acceptance of the appointment, he contracts to fulfill satisfactorily. Given the advantage of opportunities under sympathetic guidance to "show his stuff" the burden of proof of his value to the public rests upon the probationer.

He is expected to be adaptable, free of ego and aloofness, to be able to "fit in" with his fellow workers and the social environment of the average assignment.

He must demonstrate lively interest, untiring energy and abundant industry.

He must demonstrate positively a constructive appreciation of the responsibility of stewardship over property.

He is called upon to prove, or at least evidence, his willingness to subordinate self-interest to the benefits of service ideals and purposes.

He must give positive evidence of possession of those nature-

given characteristics from which flow the ability to envisage and plan work and get others to do it and do it well. In other words, he must give evidence of potential leadership, as well as that of being a good doer.

He must give recognition to the diginity of manual work by positively expressing a willingness to do it and doing it in a wholehearted way if undertaken.

He must give evidence of humility in recognizing the demands of the job and comparing its demands with the proved scope of his knowledge and ability to cope with the job's requirements.

He must demonstrate strength of character and physical fitness.

He is expected to demonstrate the promise of mastery, in good time, of the arts and crafts of forest work.

He must demonstrate ability to speak and write clearly.

He must give evidence of being a "self-starter,"—of having initiative.

He must demonstrate his willingness to subordinate his ideas to the will of the boss. On the other hand, the boss must invite ideas and discussions. If he is capable of being the boss he will recognize good ideas and accept them when advanced.

Ranger Newcomer must show that he has the stick-to-itiveness and fighting spirit that never gives up until a difficult job is done or until defeat comes, notwithstanding the dogged, determined efforts of man.

And lastly, his moral character must be above suspicion.

As the months of the probationary year pass, the attitude and work of a probationer is systematically checked. If repeated check of performance against job requirements fails to indicate that Ranger Newcomer's chance of success is a good risk upon which to gamble the amount of the salary paid from the taxpayers' money, then in fairness to the man who pays his salary and to the job, the appointment is revoked.

On the other hand, if his work, attitude and the place he has made for himself in the estimation of his superiors, merit continuing to bet good money that he will make good, he is held and finally given a permanent appointment.

The time has passed when the public can afford to continue to invest money in developing a man, either new or old in the service, after serious doubt is aroused concerning his qualifications. To do so is neither fair to the public nor to the job that must somehow be done; nor is it fair to the better qualified man who is already in or who is knocking at the gate, awaiting a chance to prove his worth.

After the statutory probationary period of one year passes, actually the trial period extends until the employee definitely proves his worth and is placed in the organization. Throughout his official life a standard of guidance and supervision is given

him that has the welfare of both the man and the job in mind. But it never should subordinate the welfare of the job to the interests of the man as long as the man is able bodied.

While the man who enters the Forest Service today is expected to meet the requirements of the assignment into which he goes, perfecton of performance is not expected. However, performance must gauge up to the good batting average of the quality man. As a business organization accountable to the American public for a just return on the dollars expended in salaries, nothing less can be accepted from Forest Service personnel.

Again, work in the Forest Service calls for men of quality. It is a waste of time for the man of low ability to try to fit himself for it. Men of mediocre ability may get by the probationary period. If so, the demands of the job will sooner or later bring him unhappiness; in the long run the great probabilities are that his job will over-power him and after expending some of the best years of his life in a mistaken venture, he will find himself seeking work elsewhere.

Men who "fit in," the "he-man" fellows with imagination, balanced judgment, strength of character, enthusiasm, energy, initiative and education during normal times are in demand. For them alluring opportunities always await in this virile, forward-seeing, advancing organization.

And what a gripping work Forestry is!

FLUCTUATION OF NATIVE GRASS CROPS ON THE NORTHERN GREAT PLAINS

(Continued from page 11)

is subject to nearly the same variation, production in 1931 showing a spread of 83.9 per cent as against 1927. Bluejoint follows closely with a maximum variation of 74 per cent. Small blue bunch grass varies 66.5 per cent, and bearded wheat grass 57 per cent. Dryland sedge is outstandingly the most consistent producer over the entire seven-year period, showing a maximum variation from 1927 of only 22 per cent during the drouth year of 1931. The total crop variation for all seven species between these two widely divergent years was 73.3 per cent, the 1931 crop being 26.7 per cent of the 1927 crop.

The season preceding the extreme year of 1931 produced a crop of 29.3 per cent of that produced in 1927, making two extremely short years in succession with resultant shortage of range feed for stock. A consistent decline in production is evident from 1927 to 1931 inclusive. The average forage crop, excluding the maximum crop of 1927, averaged 51.35 per cent of the 1927 group. Including the 1927 crop, the average is 57.30 per cent of the 1927 crop. This, translated into surface acres means that for this period, excluding 1927, 14.4 acres were necessary to carry a cow during a 5½-months summer grazing period; including 1927, 13.8 acres. For 1927 only, the acreage necessary was 9.7, while 16.9 acres were necessary in 1931. With such a wide fluctuation of production it is apparent that stocking of ranges should be on the basis of the average forage crop rather than on a crop such as was produced in 1927. Even with an average rate of stocking, supplemental feed would be necessary during seasons of short production.

GAME MANAGEMENT IN THE INLAND EMPIRE

(Continued from page 17)

it therefore follows that by and large big game management is a state responsibility in which the Forest Service (due to the large areas of National Forests in the West) must cooperate.

The information above shows briefly what has been done by the Forest Service to provide suitable range within the National Forests of Region One. We shall continue to study these game problems and make such further adjustments as are consistent with the best social and economic conditions obtaining.

The State, however, is responsible for the proper kind of utilization and the following are suggestions only as to a means whereby utilization of our big game may be had which has as its purpose the maximum use consistent with the supply in any given area.

I think it will be clear to anyone who is conversant with the facts, that the supply of game in Montana and northern Idaho is not sufficient to permit all who may have the desire to kill, to be permitted to satisfy that desire. This being the case, it would appear logical that the number of killers must be limited as a whole, and as to specific territories. A study of the numbers of deer and elk in the various parts of the Region and the probable increase that can be expected (if the predatory animal toll can be reduced 75 per cent) indicates that a safe kill of 8 to 10 thousand deer and about 3 thousand elk could be had if the distribution of hunters in the various districts were had in relation to supply of animals that could be properly killed, and that the kill as to sex were adjusted to avoid too heavy a kill on breeding stock.

My suggestion is briefly this: First, decide how many deer or elk can be safely taken, say in the various counties in the State and what per cent of males and females that would produce the maximum annual kill and yet maintain the best possible breeding herd. Second, having determined these facts for the State as a whole, the matter should then be widely advertised for a sufficient period to permit the general public to have full knowledge of the kill to be had during the ensuing season. Third, require that all applications for hunting privileges for deer or elk be on file by—say—September first; also that all applications be accompanied with the license fee and a statement as to first and second choice of hunting territory. Fourth, when the last date for receiving applications arrives, proceed to determine who will receive hunting permits by lottery. The following illustration may serve to clarify how this plan would work: Take Missoula County as a unit and suppose that it has been determined that 500 deer could be safely taken, and that 300 head should be bucks and 200 head does. Say that 700 applications had been received; each application will bear a number between 1 and 700 inclusive. Place 700 rifle balls in the ballot box, numbering 1 to 700, then place 700 rifle balls in another ballot box, 300 marked buck—

200 marked doe—200 blanks. Shake them up and draw one number from the hunter box and a ball from the game box. If—say—No. 13 draws a ball with the word "buck" on it, he gets a license to kill a buck in Missoula County, or if he draws a doe he gets a license to kill a doe in Missoula County. Or, if he draws a blank, then his application is placed among those covered by his second choice, and handled in the same manner when the lottery is held for that area. The lottery would proceed until all lottery balls were drawn from both lottery boxes.

There may be some objections to being held to kill the kind of a deer that was drawn; this may be met by issuing a metal tag with each deer or elk license, showing the sex to be killed and these may be interchangeable among hunters. Seasons would be immaterial because the number of animals to be killed would have been determined in advance and it would matter little when they were killed, except hunting during the rutting period should be avoided. Seasons in which the game killed could be best cared for and most fit for human consumption—probably most of Montana and northern Idaho could have a season from October 1 to December 1.

The advantage of such a system would be:

1. Regulate the kill more scientifically and in relation to biological factors.
2. Eliminate the over-kill in some areas and build up the kill where the conditions justify, or in other words, distribute the kill according to the distribution of game animals.
3. Secure the maximum utilization without danger of depleting any area.
4. Provide a system that would permit the building up of game in any area where this was desired, or the maintenance of game on an even level, or a reduction if desired. In other words, the system would permit the establishment of the maximum amount of game that food and other factors on any area would justify.
5. It would eliminate all controversy concerning the merits and demerits of the buck law, seasons, and like disturbing factors.
6. It would encourage better sportsmanship and build up more scientific fact-finding interest in game management on the part of game administrators and the general public, and thereby lead to better management of this important resource.

Predatory Animals

Every known effective method should be employed to reduce predatory animals and birds. The Biological Survey should be encouraged by finances and otherwise to enter the field in cooperation with all interested agencies. This organization has demonstrated that predatory animals can be held in check, if not entirely eliminated.

A definite and active program should be adopted looking to the placing in public ownership (preferably State) the key winter

game ranges now in private ownership. How can such a program be financed?

Beaver

From the experience had in New York State (See "The Beaver in the Adirondacks" Vol. 4, No. 4, July 1927, of the Roosevelt Wild Life Bulletins), Wisconsin and other private enterprises, and experiments on beaver under natural conditions and in beaver farming, it is not unreasonable to believe that a method of beaver management could be worked out in Montana which would provide an annual net income to the State of from $100,000 to $150,000, and this entirely on National Forest lands.

It is conservatively estimated that there are more than 32,000 miles of streams in the National Forests of Montana, to say nothing of the thousands of lakes, swamps, and other suitable beaver areas, and that on an average of one pair of beaver for every four miles of stream (which is ultra conservative), that the potential capacity of the National Forests would be 8,000 pairs of beaver. Now, a very conservative estimate of one and one-half beavers per pair per annum would provide 12,000 beaver annually, which at $16.00 per skin would equal $192,000 (which is less than was taken from two counties in New York State); $42,000 will employ 14 expert beaver-men year-long at $3,000 per year salary, who could handle the entire beaver problem, leaving $150,000 net to carry on other game activities. The above data on beaver is ultra conservative, and there is ample reason to believe that under proper management over a period of five to ten years, the figures used above could be doubled. Don't overlook the fact that these figures are based on National Forest land and that there is an equal opportunity to build up and capialize on an even larger and more productive field outside the National Forests. Why don't we do it?

NATIVE WOODS FOR FUEL

(Continued from page 23)

ing the ventilator in the fuel door, wood can be burned at a slow rate for heating purposes. Special grates and appliances for burning briquettes and other wood fuel in stoves and fireplaces are now available to the housekeeper.

There are more ways than one in which local woods may be used as fuel. In some regions charcoal is sold for fuel purposes as well as for technical use, and certain industrial plants use wood gas produced from waste wood. "Green" sawdust and hogged fuel are frequently made use of in such gas producers at considerable savings. Because wood is cleaner, many baking establishments continue to use wood in their bake ovens in preference to other fuels.

In certain regions where lumber mills and industrial plants are located large quantities of sawdust, shavings, and mill trimmings are used successfully as fuel for developing both heat and power. At Lewiston, Idaho, a highly efficient fuel briquette selling for about $6 to $8 per ton is being manufactured out of sawdust and shavings for use in large and small furnaces, stoves and fireplaces. This compressed fuel has two-thirds the heating value of hard coal and in addition it is clean and easy to handle. There is little smoke, no clinkers, and very little ash. The Forest Service tells us that a cord of hardwood, for example, will produce only about 60 pounds of ashes while a ton of hard coal will leave, after burning, from 200 to 300 pounds of ashes.

In the more densely populated regions where forest wood may be scarce a special type of wood briquette is made in small quantities for automobile tourist use.

The tourist or camper often searches for fuelwood with which to cook his meals or to keep him warm. Nine times out of ten he fails to select his fuel but gathers the nearest material which is often lying on the ground and therefore likely to be wet. Contrary to general belief, a standing dead tree, unless decayed, furnishes excellent fuel because it is dry.

For some purposes, such as camp fires and bonfires, it is always helpful to know which woods are most likely to throw sparks; and for the cooking fire, those woods which burn rapidly or those which produce the best bed of coals. The following native woods are common to the Montana recreational regions:

Spark-throwers: Box elder, maple, red cedar, spruce, hemlock, balsam, and larch. (Several woods when wet will "pop" a great deal.)

Kindling woods: Pitchy pieces, dry pieces of ponderosa pine, spruce, lodgepole pine, cedar, birch bark, alder.

For coals: Aspen, mountain maple, cottonwood, dogwood, mountain ash, mountain mahogany, western yew, larch, Douglas fir.

On rainy days when a camp fire is the one thing you need most and you want it quickly, it is well to know just what kind of tinder to look for and where. Dry cones of conifers, pitchy stumps, dry mosses, or lichens, on the lower dead branches of living trees, pine, fir or cedar needles which are dry and have turned red or brown, and the inner bark of dry, standing dead trees are all useful as tinder for starting your fire.

Knickers seem to be in ever-increasing popularity, despite the efforts of Centerwall, Fobes and Love to remove such from the Forestry building.

SOME HIGHLIGHTS ON A FORESTRY TRIP

(Continued from page 25)

to three cords of wood, were hauling pulp wood to the mills from a maximum distance of thirty miles at a cost of from $2.50 to $3.00 per cord. The rail haul for the same distance was $5.50 per cord plus an extra handling charge at the yard. Truck roads through the flat Jack Pine country cost from $100.00 to $125.00 per mile, extra heavy construction running as high as $500.00 per mile. The primary reason for the cheapness of this long haul is the large number of concrete highways in this region. The motor truck is not yet able to compete with the railroad on long hauls, however. One company was shipping saw logs of white and Norway pines a distance of 150 miles, many of them so defective that they contained only number four and five common lumber with a small percentage of number three.

This particular mill had no waste. All the "hog feed" went into the making of insulated building material of various kinds. Even with bad business conditions the plants were behind with the orders. However, as soon as other concerns come into the field with this same type of industry or even closer utilization, this advantage will be lost. One thing is certain—it pays to manufacture diversified products. If one product is not moving, another is and the profits of one can pay the losses on another. All those concerns that were manufacturing lumber, pulp, paper and fabricated building materials jointly, under the same management were more than paying expenses on the operation of the entire plant. They were thus able to keep their organizations together and keep down expensive overhead charges.

This may be one solution to the problem of the Western lumber industry—a diversified product. Fortunately for the industry, the investment is heavy in this type of equipment so that under-financed concerns will have difficulty in entering the field and disrupting the market to everyone's disadvantage. Nevertheless, there is considerable danger of over-expansion in this industry of close utilization, so that the economic bottom will drop out of the forest products industry and it will find itself in the same position as the lumber industry. This is what has happened to the pulp and paper mills of Canada. Last summer there were only about twenty per cent of them operating and these were very uncertain as to the length of time they could continue.

However, no one concern can long hold a dominant place in an industry if the profits are sufficient to attract capital. In the cellulose industry there is promise that such is the case. Eventually it will come to capacity production where such things as slight margins on the price of the raw material or on the manufacturing costs will mean the difference between profits or losses. When such a thing occurs, it means that more efficient methods of manufacture must be found rather than *close utilization*. An

example of this matter of efficiency in industry was noticed in the iron mines in Minnesota. In 1914, two men working 10 hours per day got out from nine to fourteen tons of ore. In 1930, however, two men working *eight hours* per day mined *180 tons of ore.* The principal result of this increased efficiency was that the miners were all out of work and there was a supply of ore sufficient to last the industry for a decade. One man doing the work of ten means nine of them are going to have to take enforced vacations. The lumber industry is about the only major industry that has not increased the efficiency of its labor. Whether or not this is a blessing remains to be seen. Since it must compete with other industries some changes will have to be made.

The South holds the most interest for the forester. The first impression I gained was the enormous possibilities for industrial development that the South offers. Everything is in its favor. Had the Pilgrims and Puritans landed at Savannah rather than Plymouth the North would still be a wilderness. Nevertheless the South will occupy the dominant position in industry in North America within the next two or three decades. Forestry will occupy a relatively strong position in this region. Wood material grows with startling rapidity, a four-year-old slash pine attaining a size of three inches at B. H. and fourteen to sixteen feet in height on the best sites. In Southeastern Arkansas, a plantation of this size and age was examined. It was planted on an old field. The farmer stated he could make more money growing pulp wood than he could from farming the land and with much less work!

There seems to be a great possibility that this species will develop into first class material for news print. When cut in the "sap stage" of its life, it contains less pitch than spruce. It is claimed that it has a longer fiber and thus will make a stronger paper. If it is commercially feasible to secure slash pine pulp wood on the above basis, the South bids fair to become the center of the news print industry.

Forestry is being practiced by several large concerns in the South. Silviculture is being tried only where it will pay its way and no thought is given to the good that the practice may do the stand. The method used must pay expenses *now*, letting future benefits take care of themselves. Much experimentation is being tried by the various pulp mills in cutting the cost of pulp manufacture. One concern treats the chips in the digester with live steam before cooking, thus securing on the average some twenty gallons of high grade turpentine from each digester. The method of reclaiming the chemical in the sulphate process seemed rather expensive and cumbersome. It looks as though considerable improvement could be made in the process at this point.

In the matter of forestry, two concerns are specializing in growing slash pine. It is a better tree to cup for Naval stores and at the same time yields as good a grade lumber as the longleaf. As a matter of fact, it is doubtful if the lumber from the

two trees can be definitely identified one from the other in the yard. The two are marketed together as longleaf. If fire is kept out for four or five years slash pine will come in on land suited to it if there are seed trees present. It is a good seeder. The young trees have to be protected the first four or five years before they become sufficiently fire resistant to survive repeated burnings. After the stand reaches this age, it is the opinion of many foresters in that region that fire would be beneficial to the stand in keeping the litter at a minimum, thus preventing destructive fires from occurring.

However, little is being said about this phase of forest protection at the present time. The general public would not understand the situation. Foresters on one hand preach fire protection and on the other burning the woods over. It would make an impossible situation to handle at the present stage of public education. However, one forester is experimenting with the use of fire in the woods. His object is to determine when and how to use it to the best advantage in the protection of the timber. He feels that foresters should be ready, as soon as public education is sufficiently advanced, to employ this arch enemy of the forests as an ally in their protection.

The Agricultural Experiment Station at McNeil, Mississippi, has been conducting work along this line for the past ten years in connection with grazing studies in the longleaf pine type. The average seasonal gain per head on cattle placed in unburned pasture was 99 pounds, while in the pasture burned over annually, it was 143 pounds. However, there is little or no authentic data on the damage that is being done to the reproduction on the area. It will require another twenty years to fully determine this. It requires about eight years for the longleaf seedling to get its head out of the grass. After this it grows at the rate of from two to four feet per year in height. It is during this period of its life that it is very susceptible to fire. The director of the station, who is not a forester, maintains that the damage is negligible to the timber and in reality is benefited by the burning. However, this is a disputed point and one not yet substantiated.

With the results of the experiment being published and broadcast over the region it is causing great confusion in the minds of the public in the use of fire in the woods. It makes the work of those responsible for carrying out fire protection policies and education exceedingly difficult. Most of the incendiarism in the South is from burning the woods over for grazing purposes. With the results of the above experiment in his mind, it is almost hopeless to convince the Southern "cracker" that he shouldn't set fire to the "piney woods." It is largely a case of forest rights developing on private property. The scrub cattle and hogs of the native roam at large over the land with little or no attention on his part other than seeing that the woods are "greened" up in the spring. He doesn't own the property and consequently has no interest in the amount of damage that may be done to other values on the land. He feels that it is his to use free of all charges and responsibility.

On fenced land, however, little trouble is experienced. These rights seem to be easily extinguished as soon as the land is enclosed. However, this is an expensive improvement, since the fence must be of a type that will turn a "razor back" hog. Fire is rarely set on fenced land except occasionally by some disgruntled native to "get even" with the owners for a real or fancied grievance. In general the fires in the region are easily controlled, being largely surface grass fires. However, if there is a large quantity of litter on the ground, and a strong wind, it quickly goes into the crowns. Even then it does much less damage to the stand than one would normally expect from such a fire.

Fire fighting is done by means of whipping the fire out with a brush of pine boughs or a sack. The fires are quite easily controlled. Negro labor in charge of a white foreman is employed, and the rate of pay is fifteen cents per hour and they board themselves. With the right sort of "boss" they are high grade workers, and man for man they will do as much or more than the white labor in the North and at less than half the cost.

Planting in this region rarely exceeds five dollars per acre including the stock. Seven month old stock is used, and even then it is rather large to be handled to the best advantage. The plants are spaced six feet in furrows that are plowed eight feet apart. This gives a spacing of six by eight feet, and as soon as the canopy begins to close, every other tree is taken out of the furrow, leaving the spacing eight by twelve, thus reducing the stocking from about 900 to 450 trees per acre. Even this is still too dense for a turpentine orchard and when about twenty years of age the stand is further thinned to about 150 trees per acre. This is usually done by turpentining them to death. The exact number that will give the best results and at the same time make timber that will pay to move off the land after cupping, is not known. Some experimentation is being carried on to determine this, and many of the Naval store's men maintain that it will pay to plant the turpentine orchards. One hundred and fifty cups per

acre can be obtained under planted conditions as against about 20 cups per acre under natural conditions. This makes a cheaper operation and many operators are planting their orchards. The minimum diameter for breast height for cupping is about nine inches. To grow to this sizes requires twelve years for slash pine on average sites.

The Naval store's market like many other things is in a bad condition. One of the chief uses for rosin at one time was for the base in varnishes. Now coal tar products have crowded this out of the varnish trade until rosin is now considered an *adulterant* in varnish and may be found only in the very poorest grades if found at all. In addition to this, "Duco" paint products are killing the turpentine market. To aggravate this situation it has been discovered that making a new "streak" each day on a cup face will give 80 per cent of a five year yield to one year. This is a system, however, that foresters only recommend for mature timber that is ready to be cut for lumber.

From Florida the route was laid through the Smokies and the Blue Ridge Mountains, partly over the "Trail of the Lonesome Pine," made famous in story and song. At Asheville, North Carolina, a visit was made to the Southern Appalachian Experiment station and trips were made into the nearby woods. The most interesting spot was the plantation of eastern white pine established by Dr. Schenck on the Biltmore Estate in the late "nineties." This is now a beautiful forest with trees averaging from 9 to 10 inches and 60 to 70 feet in height. All of this estate except a small portion of 13,000 acres was sold to the Government and is now known as the Pisgah National Forest.

One thing that was especially noticeable in this region was the dense cover of hardwoods over the entire area. It is true that most of it is pretty scrubby, but it furnishes great protection to the sandy clay hillsides in the prevention of erosion. Comparatively little damage to the soil from this cause was noticed over the entire length of the Appalachian system. The hardwoods keep the soil covered in spite of fire or any other forms of destruction. The outstanding point of interest was the inspection of a tract of the old virgin forest in one of the "coves." The canopy was closed and the ground was nearly bare of any form of undergrowth. Here were tulip poplar trees 40 inches or more at B. H. and having four to six logs of clear length. Some of the oaks were nearly as big. The scene was somewhat marred by the grey gaunt skeletons of the old chestnuts here and there in the stand—victims of the "blight."

On the whole the opportunity for practicing forestry in the hardwood region did not make a very favorable impression. It is a fairly long time job with a low priced product at the end. The picture for industrial forestry in the central hardwood region looks very gloomy and uninviting. It will be a job for only the Federal Government or the States to handle. Much of the land

It has been suggested that the winter quarter of logging engineering be changed to a course in dart throwing. It would be equally profitable.

is of little value for any purpose other than forestry and much of it is of doubtful value for even this.

The next point of interest was the Hammermill Paper Company at Erie, Pennsylvania. At the Hammermill plant I found the pulp wood, mostly spruce, coming from near the mouth of the St. Lawrence River, a distance of nearly 1,200 miles. It was shipped entirely by water, so was not expensive compared to railroad hauling. However, I saw some pulp wood shipped in from Russia, each stick hand shaved with a draw knife, at about the same price or a little cheaper than the company was paying for its own wood.

Peeled or "rossed" wood is not as desirable for pulp as that with the bark on. This is on account of not being able to get the accumulated dirt and stain off the peeled wood before it goes to the digesters. The bark on the stick keeps it free of dirt and stain during storage and thus prevents the paper from being streaked. This is especially important with a concern like the Hammermill Company where they specialize in high grade book and writing papers. Much of the wood was rough, having protruding knots that prohibited close piling. I suppose this was one of the tricks of the wood cutters to secure a greater cordage with a given amount of wood. It would have paid the company, however, to have given a little more for the cutting so that more wood could have been piled in less space on the boats. Nothing was done about it, however.

After leaving Erie, the route was laid for Boston via Syracuse and the Adirondacks. The forestry outlook in New York and the New England States is about the same as that in the Central Hardwood Region. It is not encouraging as an industrial enterprise. It is purely a function of the states or the Federal Government to handle. At the Harvard Forest an opportunity arose to see a sample of the reforestation work in this region. This was experimental work in the planting of White Pine. The cost of this work was excessive due to the areas being taken by scrub hardwoods that have no value as wood producers. These choke out the valuable species and in order to favor them expensive thinnings must be made, cutting out the scrubs. The cost of establishing a white pine plantation runs as high as $30.00 per acre. On paper the returns from a white pine plantation will pay this cost to the owner. It was difficult to see this, however, due to the depredations of Peley's Weavil in killing the terminal bud of the tree. This causes the tree to become bushy in form and the bole exceedingly crooked. As a result the mature tree will offer only about one log of good lumber at maturity—the remainder being suitable only for box shook and short length stuff. It is doubtful if this species can be grown with profit anywhere in this region. This does not take into consideration the damage that may occur from the White Pine Blister Rust.

ALUMNI DIRECTORY

1904

Bunker, Page S. ..... State Forester, Montgomery, Ala.

1906

Jones, John D. ..... 2139 East Coal Ave., Albuquerque, N. Mex.

1907

Bonner, James H. ..... 3420 East First St., Long Beach, Calif.

1909

Farmer, Charles ..... 415 No. Benton, Helena, Mont.

1911

Bishop, Arthur E. ..... Native Sons Bldg., Sacramento, Calif.

1912

Hubert, Ernest ..... School of Forestry, Moscow, Idaho

1914

Whitaker, Jocelyn ..... 14 Pin Pin, Manila, P. I.

1915

Ade, Harry G. ..... U. S. F. S., Missoula, Mont.
Whisler, Fred H. ..... 741 Woodford St., Missoula, Mont.

1916

Lansing, Harold ..... (Deceased)

1917

Brooks, James F. ..... U. S. F. S., Kooskia, Idaho
Kent, Hugh ..... 328 S. Clifton Ave., Park Ridge, Ill.
Richardson, Wm. D. ..... 723 Wall St., Los Angeles, Calif.
Simpkins, Edward ..... Shell Oil Co., Los Angeles, Calif.

1918

White, Wellington ..... U. S. F. S., Kalispell, Mont.

1919

Hayes, Henry F. ..... Potomac, Mont.

1920

Butler, Everett ..... 256 Madison Ave., Alton, Ill.
Dacanay, Plicado ..... Bureau of Forestry, Manila, P. I.
Kohner, William J. ..... 1641 Acacia Ave., Los Angeles, Calif.
Ireland, Russell ..... 4911 Lynn St., Los Angeles, Calif.
Whisler, Harold ..... 741 Woodford St., Missoula, Mont.

1921

Baker, Clyde P. ..... Clearwater Timber Co., Lewiston, Idaho
De Jarnette, George M. ..... U. S. F. S., Missoula, Mont.
Dirmeyer, Earl P. ..... Inkster, Mich.
Franco, Felix ..... Bureau of Forestry, Manila, P. I.
Hendron, Harold ..... U. S. F. S., Helena, Mont.
Radtke, Leonard ..... U. S. I. S., Hoopa, Calif.
Williams, Ross ..... Syracuse University, Syracuse, N. Y.
Wolfe, Kenneth ..... U. S. F. S., Kalispell, Mont.
Zeh, William H. ..... U. S. I. S., McNary, Ariz.

1922

Dexter, Albert K. ..... Perry-Curtin Lumber Co., Kosciusko, Miss.
Hutchinson, Frank ..... Canterbury College, Christchurch, New Zealand
Laraya, Sixto ..... Bureau of Forestry, Manila, P. I.
Valderrama, Felipe ..... Bureau of Forestry, Manila, P. I.
Warner, Neil G. ..... 2207 Jackson St., Spokane, Wash.

1923

Allan, W. S., Jr. ..... 319 Pine St., Louisville, Ky.
Brady, Paul G. ..... 1409 N. Dearborn St., Chicago, Ill.
Fry, W. E. ..... U. S. F. S., Sheridan, Mont.

Hoyt, Harrison.....U. S. B. S., Hot Springs, S. D.
McDonald, Charles.....U. S. F. S., Wilson, Wyo.
Madsen, Edward G.....U. S. F. S., North Fork, Calif.
Sandvig, Earl.....U. S. F. S., Dillon, Mont.
Shull, J. Theodore.....C. W. P. Co., State Camp, Cathlamet, Wash.

1924

Colville, Leslie.....U. S. F. S., Bend, Ore.
Crowell, Ralph.....U. S. F. S., Superior, Mont.
Daproza, Juan (M. S. '25).....Bureau of Forestry, Manila, P. I.
Graham, Don C.....1032 Stratmore Ave., Crafton, Pa.
Koziol, F. C.....U. S. F. S., Weiser, Idaho
Lambert, Lahman.....33 West King St., Chambersberg, Pa.
Myers, Remley.....618 Realty Building, Spokane, Wash.
Nicholaus, Charles.....McClure, Va.
Nicholaus, Howard.....22 E. North St., Bethlehem, Pa.
Painter, William.....618 Realty Building, Spokane, Wash.
Riley, Marvin.....618 Realty Building, Spokane, Wash.
Zamansky, Allen.....614 F. St. SW., Washington, D. C.

1925

Bitney, Raymond.....Neah Bay Indian Agency, Neah Bay, Wash.
Brown, L. Walker.....State Highway Commission, Missoula, Mont.
Caguioa, Vincente.....(Address unknown)
Cramer, John A.....U. S. F. S., Livingston, Mont.
Fields, Ralph.....U. S. F. S., Billings, Mont.
Hicks, Harold.....U. S. B. S., Winona, Minn.
Lee, Bernard.....U. S. F. S., John Day, Ore.
Rowland, Thomas.....U. S. F. S., Missoula, Mont.

1926

Baggs, John.....Clearwater Timber Co., Pierce, Idaho
Beall, Carl F. (M. S. '30).....U. S. I. S., Fort Defiance, Ariz.
Bowers, Raymond.....U. S. F. S., Jackson, Mont.
Burtness, Allen C.....Virginia, Minn.
Canfield, Roy.....Jornado-Range Res., Las Cruces, N. Mex.
Lukens, Stanley.....U. S. F. S., Missoula, Mont.
Merryfield, Leroy.....Hodges Ranch, Ennis, Mont.
Preston, John C.....N. P. S., Estes Park, Col.
Russell, Harold.....Headquarters, Idaho
Thompson, John T.....U. S. F. S., Priest River, Idaho
Van Meter, Thomas.....U. S. F. S., Hailey, Idaho

1927

Bischoff, Paul.....1533 Helena Ave., Missoula, Mont.
Bloom, Charles.....U. S. F. S., Missoula, Mont.
Darlington, Josephine.....Washington University, St. Louis, Mo.
Kumler, Charles.....Hines Pine Co., Burns, Ore.
Logan, Jose.....Bureau of Forestry, Manila, P. I.
Richards, Everett.....408 Florence St., Missoula, Mont.
Roemer, Alban.....University of Michigan, Ann Arbor, Mich.
Rubottom, Carter.....U. S. F. S., Grey Cliff, Mont.
Shaw, Donald.....124 W. 6th St., Delta, Colo.
Spencer, Mattison.....4845 St. Anthony's Cathedral, Chicago, Ill.
Tennant, Raymond.....Encampment, Wyo.
Van Winkle, Harry.....U. S. F. S., Mackey, Ida.

1928

Anderson, Homer.....Principal of Schools, Rosebud, Mont.
Adams, L. Barkes.....Weyerhaeuser Timber Co., Longview, Wash.
Campbell, Lloyd S.....Intermountain Transportation Co., Missoula, Mont.
Davis, Kenneth.....University of Michigan, Ann Arbor, Mich.

Emerson, John.....Central Gr. Plains Exp. Sta., Cheyenne, Wyo.
Mathews, Lewis.....N. Dakota School of Forestry, Bottineau, N. Dak.
Merrill, Lee.....941 Mira Vista Terrace, Pasadena, Calif.
Spaulding, Clarence.....U. S. F. S., Missoula, Mont.
Tennant, Earl.....U. S. F. S., Lolo, Mont.

1929

Ashbaugh, Leonard.....Syracuse University, Syracuse, N. Y.
Averill, Clarence.....Rocky Mt. Exp. Sta., Colorado Springs, Colo.
Cornell, Gordon.....N. P. Land Department, Helena, Mont.
Dix, Howard.....Interstate Lumber Co., Stevensville, Mont.
Ernst, Emil.....Yosemite Park, Yosemite, Calif.
Flock, K. D.....U. S. F. S., Missoula, Mont.
Fritz, Nelson.....519 McCabe Ave., Wilmington, Dela.
Frost, Levi.....Harvard Forest, Petersham, Mass.
Jackson, Chester.....U. S. F. S., Missoula, Mont.
Johnson, James H.....(Address Unknown)
Krofchek, Andy.....State Highway Dept., Ames, Iowa
Luer, Elmer.....207 First Nat. Bank Bldg., Missoula, Mont.
Nelson, Donald.....1000 Seventh Ave., Dodge City, Kan.
Rouse, Charles.....U. S. B. S., Nome, Alaska
Staat, Fred.....618 Realty Bldg., Spokane, Wash.
Vierhus, Louis.....Weyerhaeuser Timber Co., Klamath Falls, Ore.

1930

Aiton, Jack.....Yellowstone Park, Wyo.
Dahl, Jerome.....317 W. Spruce St., Missoula, Mont.
Fallman, Arthur.....U. S. I. S., Cheyenne Agency, S. Dak.
Grove, Joe.....Glenwood, Minn.
Jost, Jack.....U. S. F. S., Missoula, Mont.
Leavitt, Roswell.....U. S. F. S., Libby, Mont.
Mass, Fred.....Paradise, Mont.
Mathews, J. Thomas.....U. S. F. S., Daniel, Wyo.
Park, Barry.....U. S. F. S., Missoula, Mont.
Phillips, Floyd.....U. S. I. S., Klamath Agency, Ore.
Rudolph, Rosser.....U. S. I. S., Poplar, Mont.

1931

Brown, William J.....Box 3, Route 190, Vancouver, Wash.
Calkins, Raymond.....409 Mount Ave., Missoula, Mont.
Carlson, Sture.....N. P. Land Department, Helena, Mont.
Centerwall, Willard.....U. S. I. S., Lame Deer, Mont.
Clark, Ellis.....345 Fifth St., Bristol, Tenn.
Murchie, Archie A.....724 Eddy Ave., Missoula, Mont.
Oren, Eugene.....615 Third St., New Cumberland, Pa.
Rector, Charles.....U. S. F. S., Prineville, Ore.
Redding, Hugh.....U. S. F. S., Elk City, Ida.
Sadasuk, J. Jack.....204 W. Shirley St., Mount Union, Pa.
Smith, Howard.....1801 Market St., Harrisburg, Pa.
Tucker, David.....U. S. F. S., North Fork, Calif.
Walker, Carl.....(Address Unknown)

Dr. Schenck: Do you smoke?
Beechel: Once in a while.
Dr. Schenck: Now's the while.

The relation of witchcraft to forest management can best be explained by Fay Clark.

STUDENT ENROLLMENT

The following is a list of the students enrolled in the Forest School for the term 1931-1932.

Name and Address	Class	Quarters Attended
Anderson, Lief, 1950 Hodge St., Portland, Ore.	Fr.	1,2
Augenstein, James, R. F. D. No. 1, Delaware, Ohio	So.	1
Bauer, Forrest, Polson, Mont.	Fr.	1,2,3
Beechel, Kenneth, Oregon, Wis.	Sr.	1,2
Bernhard, Lloyd, Napa, Calif.	Fr.	1,2,3
Benson, Fred, American Falls, Ida.	Jr.	1,2,3
Beagarie, Max, East Templeton, Mass.	Fr.	1
Barker, Harold, Polson, Mont.	Fr.	1,2,3
Beardsley, Robert, Elko, Nevada	Fr.	1,2,3
Boe, James, Missoula, Mont.	Fr.	3
Boe, John, Missoula, Mont.	Fr.	3
Bohlander, Lincoln, Billings, Mont.	Fr.	1,2,3
Boyer, Howard, Hermosa, S. Dak.	Fr.	1,2,3
Brooks, George, Mt. Shasta City, Calif.	Fr.	1,2,3
Brown, Dudley, Palo Alto, Calif.	Fr.	1,2,3
Burnett, James, Stevensville, Mont.	Fr.	1
Campbell, Alastair, Camas, Mont.	Fr.	1,2,3
Coey, Edward, Poplar, Mont.	Fr.	1
Cyr, Elmer, Alberton, Mont.	Fr.	1,2,3
Cook, Fred, Dewey, S. Dak.	Fr.	1,2,3
Cooney, Robert, Canyon Ferry, Mont.	Sr.	1,2,3
Clark, Ellis, Bristol, Virginia	Sr.	1
Coon, Howard, St. Maries, Idaho	So.	1,2,3
Curtiss, Frank, Galata, Mont.	Jr.	1,2,3

Calkins, Raymond, Missoula, Mont.	Gr.	1,2,3
Centerwall, Bruce, Crystal Bay, Minn.	Sr.	1,2,3
Chapin, Wilbur, Hamilton, Mont.	Sr.	1,2,3
Dahl, Oliver, McIntosh, S. Dak.	Fr.	1,2
Davidson, Robert, Libby, Mont.	Fr.	1,2,3
Dresskell, Wilfred, St. Regis, Mont.	So.	2,3
Donovan, Edwin, Elliston, Mont.	Fr.	1,2,3
Davis, William, Missoula, Mont.	Jr.	3
Dobrinz, Edward, Fargo, N. Dak.	Jr.	1,2,3
Evenson, Millard, Whitefish, Mont.	Jr.	1,2,3
Faunce, Charles, Polson, Mont.	Sp.	2
Foley, George, Victor, Mont.	Fr.	1,2,3
Foust, Russell, Stevensville, Mont.	Fr.	1
Fosdal, Arne, Stoughton, Wis.	So.	1,2,3
Frankel, Jerome, Cleveland, Ohio	So.	1,2,3
Flint, Alfred, Philipsburg, Mont.	Sr.	1,2,3
Fager, John, Durango, Calif.	So.	1,2,3
Fobes, Eugene, Eagle Rock, Calif.	Sr.	1,2,3
Frykman, Joel, Missoula, Mont.	Jr.	1,2,3
Garvin, Amer, Havre, Mont.	Fr.	1
Glaus, Bernie, Chamberlin, S. Dak.	Jr.	1
Gallup, Richard, Sunburst, Mont.	Jr.	1,2,3
Guntermann, William, Santa Barbara, Calif.	Sr.	1,2,3
Goodacre, Egan, Grand Mere, Quebec	So.	1,2,3
Halvorson, Elon, Billings, Mont.	So.	1,2
Hall, Glen, Missoula, Mont.	Fr.	1
Herweg, Fred, Missoula, Mont.	Fr.	1,2,3
Hague, Lloyd, Missoula, Mont.	Fr.	1,2,3
Harrison, Allan, Wichita Falls, Tex.	Fr.	1,2,3
Hesselschwerdt, Joe, Urbana, Ill.	Jr.	1,2,3
Hinman, John, Rapelje, Mont.	So.	1,2,3
Hale, John, Butte, Mont.	So.	1
Hawk, Lawrence, Milwaukee, Wis.	Sp.	2
Henson, William, Kansas City, Mo.	Jr.	1,2,3
Hancock, Morris, Glendive, Mont.	Jr.	1,2,3
Holgren, Robert, Missoula, Mont.	Jr.	1,2,3
Hall, Rufus, Two Dot, Mont.	Jr.	1,2,3
Hawes, Evans, New Bedford, Mass.	Sr.	1,2,3
Hoye, Oliver, Chisholm, Minn.	Sr.	1,2,3
Issacson, John, Missoula, Mont.	Fr.	1,2,3
Ibenthal, William, Middleton, Wis.	Sr.	1,2,3
Jacobson, Arthur, Banks, N. Dak.	Sp.	2,3
Jenkins, Walter, DesMoines, Iowa	So.	3
Jensen, Chandler, Dassel, Minn.	Sr.	1,2
Kielman, Lester, Hobson, Mont.	Fr.	1,2,3
Kipp, Donald, Midwest, Wyo.	Gr.	2
Kirby, James, Everett, Ohio	So.	1,2,3
Knapp, Aaron, Missoula, Mont.	Jr.	1,2,3
Landall, Lincoln, Brockton, Mass.	Fr.	1,2,3
Langdale, Robert, Short Beach, Conn.	Fr.	1,2,3
Lewellyn, James, Eureka, Ill.	Fr.	1,2,3
Little, Ewing, Missoula, Mont.	Fr.	1,2,3
Little, Jack, Missoula, Mont.	Fr.	2,3
Lantz, Carl, Wellman, Iowa	So.	1,2,3
Lawrence, Mark, Missoula, Mont.	Jr.	1,2,3
Love, Iver, Missoula, Mont.	Sr.	1,2,3
Levesque, Haydon, Great Falls, Mont.	Fr.	1
Larson, Stanford, Missoula, Mont.	Sr.	1,2,3
Marcyes, Hiram, Missoula, Mont.	Fr.	1,2,3
Mallon, Andrew, Anaconda, Mont.	Fr.	2
Morris, John, Missoula, Mont.	Sp.	2

Miller, Victor, Emporia, Kansas	Fr.	1,2,3
Morrison, John, Livingston, Mont.	Fr.	1,2,3
Myers, Robert, Missoula, Mont.	Fr.	1,2,3
Main, Paul, Ada, Ohio	Fr.	1
Matsen, Robert, Oregon, Wis.	Jr.	1,2
Matson, Raymond, Eveleth, Minn.	Sr.	1,2,3
McDaniels, Lewis, Missoula, Mont.	So.	1,2,3
Morris, Ralph, Edgerton, Wyo.	Jr.	1
Murchie, John, Searles, N. Dak.	Fr.	1
Murchie, Archie, Searles, N. Dak.	Gr.	1,2,3
McCarty, Marion, Wilkinsburg, Pa.	Jr.	1,2,3
McDonald, Jack, Livingston, Mont.	So.	1,3
Nooney, Jean, Chicago, Ill.	Fr.	1,2,3
Nugent, Amos, Missoula, Mont.	Jr.	1,2,3
Neff, Lawrence, Missoula, Mont.	Sr.	1,2,3
Olsen, Roy, Cushman, Mont.	So.	1,2,3
O'Neil, Charles, Pomona, Calif.	Sr.	1,2,3
Periman, Arthur, Drummond, Mont.	Fr.	2,3
Phillips, Dale, Fairfield, Wash.	Fr.	1,2,3
Pettus, Marion, Missoula, Mont.	Fr.	1,2,3
Pool, Walter, Torrington, Wyo.	Jr.	1,2,3
Quanstrom, Roy, Chicago, Ill.	Fr.	1
Quinlin, Carter, Rahway, N. J.	Jr.	1,2,3
Robbins, Lester, Brockway, Mont.	Fr.	1,2,3
Richardson, Burton, Missoula, Mont.	Fr.	1,2,3
Rauma, Edwin, Eveleth, Minn.	So.	1,2,3
Roffler, Hans, Hebron, N. Dak.	So.	1,2,3
Roskie, George, Billings, Mont.	Fr.	1,2,3
Renshaw, Jimmy, Missoula, Mont.	Sr.	1,2,3
Robertson, George, Amherst, Mass.	So.	1,2,3
Shields, John, Butte, Mont.	Sr.	1,2,3
Stillings, Warren, Missoula, Mont.	Sr.	1,2,3
Spaulding, Alfred, Missoula, Mont.	Sr.	1,2,3
Schmoll, Edward, Chicago, Ill.	Fr.	1
Seger, Burton, Scobey, Mont.	Fr.	1
Shea, Patrick, Polson, Mont.	Sp.	2
Simons, Edward, Dillon, Mont.	Fr.	1,2,3
Sparrow, Orville, Anaconda, Mont.	Fr.	1,2,3
Stein, Edwin, Miles City, Mont.	Fr.	1,2,3
Stevens, DeLyle, Wyala, Mont.	Fr.	1,2,3
Schlicher, Raymond, Centerville, Iowa	Fr.	1
Stephenson, Albert, Pierre, S. Dak.	So.	1,2,3
Turrell, Joe, Amherst, Mass.	Fr.	1,3
Taylor, Claude, Hot Springs, Mont.	Fr.	1
Tower, George, Missoula, Mont.	Fr.	2
Vlasoff, William, Harbin, China	Jr.	2,3
Walker, Norman, Ronan, Mont.	Fr.	1,2,3
Welton, Warren, Townsend, Mont.	Fr.	1,2,3
Welton, Earl, Townsend, Mont.	So.	1,2,3
Wentworth, W., Great Falls, Mont.	Fr.	1
Whitesitt, Donald, Stevensville, Mont.	Fr.	1,2,3
Williams, R. T., Sioux City, Iowa	Jr.	1
Wandrey, Martin, Cumberland, Wis.	So.	1
Wagner, Joe, Missoula, Mont.	So.	1,2,3
Woolfolk E. J., Mona, Wyoming	Sr.	1,2,3
White, Jack, Missoula, Mont.	Sr.	1,2,3
Whitaker, Richard, Missoula, Mont.	Jr.	1,2,3
Whicher, Gene, Big Timber, Mont.	So.	1,3
Wildschut, Hugo, Los Angeles, Calif.	Fr.	1,2,3
Young, Earl, Chattaroy, Wash.	Sr.	1,2,3
Young, Merlin, Somers, Mont.	Fr.	1,2,3

Clark (as Renshaw fell off of chair): You can go to sleep and fall off your chair but you can't hold me responsible.

Ibenthal seems to have the power of possession when he speaks to "our secretary."

Skeels' description of Renshaw—The little fellow with the big brown eyes.

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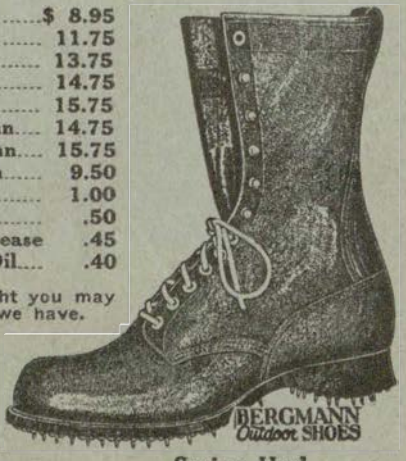

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