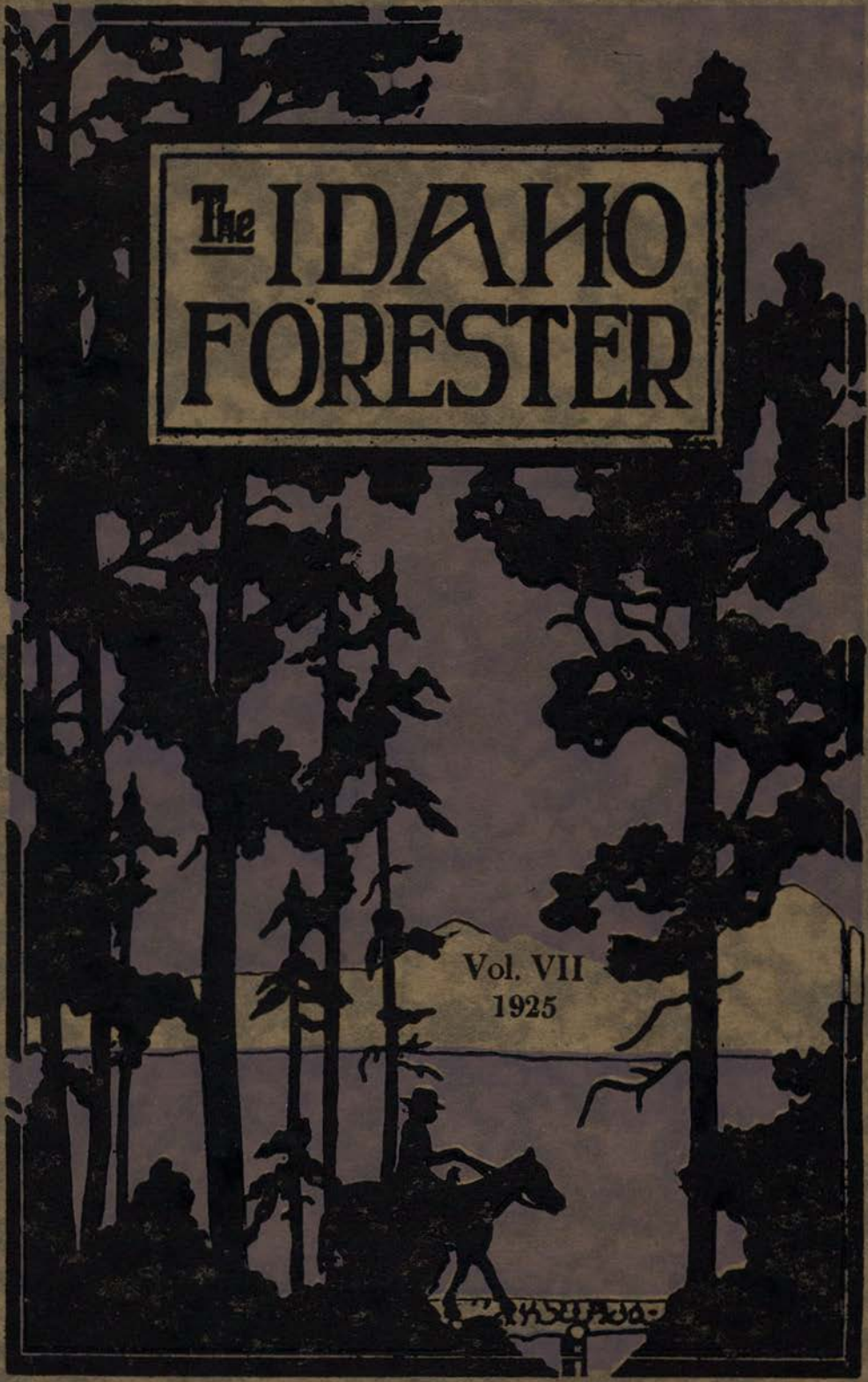
# The IDAHO FORESTER



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# The Idaho Forester

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*In recognition of the conspicuous service he has rendered in promoting forestry in Idaho, more particularly in placing the state timber lands under forest management, this edition of the Idaho Forester is dedicated to the*

*HONORABLE I. H. NASH*

*State Land Commissioner*

# WHY A STATE CONSERVATION POLICY IN IDAHO

I. H. NASH
Land Commissioner, State of Idaho

The legislature of 1925 succeeded in passing a law, which is the inauguration of a conservation policy that can be made of vital benefit to the timber resources of the State. It was framed by a committee well versed in the subject of forestry; men with only the interest of the State as a whole in mind, not that of any particular section or individual: F. G. Miller, Dean of the School of Forestry of the University of Idaho, Chairman; W. D. Humiston, Potlatch Lumber Company; Guy B. Mains, U. S. Forest Service; C. K. McHarg, Jr., U. S. Forest Service; Ben E. Bush, State Timber Cruiser and Land Appraiser; H. C. Shellworth, Boise Payette Lumber Company; W. B. Kinne, small timber owner; W. G. Swendsen, Commissioner of Reclamation; Chas. A. Fisher, small logger; Hugh Sproat, Idaho Wool Growers Association; Carl E. Brown, small timber owner; L. E. Dillingham, Idaho Cattle and Horse Growers Association; R. E. Shepherd, irrigationist.

The law seeks to adopt a permanent forest policy, based on the theory that the State must cooperate with the other timber owners in timber protection, both because of its general responsibility to protect property and its interest as a large timber holder. The general administration of the law is vested in a State Cooperative Board of Forestry.

The State owns about 9.10 per cent of the timber within its boundaries; 29.6 per cent is in private ownership, and 61.3 per cent belongs to the Federal Government.

The State came into possession of its timber holdings through Land Grants made by the United States Government for the benefit of the State's institutions.

In addition to a grant of Sections 16 and 36 in each township, approximately 3,000,000 acres for public school purposes, the following acreage was granted for other institutions:

| | | |
|---|---|---|
| Insane Asylum | 50,000 | Acres |
| Public Buildings | 32,000 | '' |
| Normal School | 100,000 | '' |
| Charitable Institutions | 150,000 | '' |
| Scientific School | 100,000 | '' |
| Agricultural College | 90,000 | '' |
| Penitentiary | 50,000 | '' |
| University (State) | 50,000 | '' |
| University (Territorial) | 46,080 | '' |
| Total | 668,080 | Acres |

The first selection of timber land was made in 1883, when 15,360 acres of University land were selected under the old Territorial Grant. No other selections were made until after Statehood. Commencing in 1891 selections were made each year until 1908, when all the grants, except 194.13 acres were reported filled. Cancellation of selections and errors made from time to time, have changed this acreage, the records today showing 2,049.57 acres yet to be selected. Out of these selections and School Sections 16 and 36, which contain timber, it is estimated that there are 700,000 acres of timbered land belonging to the State. These holdings are scattered throughout the timbered areas of the State, ranging from small forty-acre tracts up to large bodies containing thousands of acres. They vary in nature from scrubby growth or unmarketable species, to the thick stately stands of white pine, which are among the most valuable timbers of the State or Nation.

The State has in a compact body 177,545 acres, in the Priest River area in Bonner County—estimated to contain 1,100,000,000 feet of merchantable timber, 20% of which is white pine. In the Clearwater district are 132,277 acres, estimated at 4,000,000,000 feet of merchantable timber, 35% of which is white pine. The State has remaining in compact bodies about 55,000 acres of timbered lands south of the Salmon River, roughly estimated to contain about 509,598,000 feet.

One hundred forty-eight thousand acres of State lands are in the U.S. Forest Reserve, not all timbered, however, and a close estimate of the timber on this acreage made in 1922 gives 250,000,000 feet. The remaining timbered acreage is in smaller bodies, ranging from a half township down to forty-acre tracts, the principal parts of which are on Sections 16 and 36.

The estimates above given are not based on an actual cruise of the timber as the State has never had such a cruise made, but they are compiled from the best data available.

Honest opinions differ on the advisability of selling state timber. Some hold that it should

all be disposed of irrespective of demand or price in order that the State may have use of the interest and avoid the cost of fire protection. I, for one, hold a different opinion. Timber should be offered for sale no faster than there is a good reasonable demand for it, and should not be put on the market in the absence of such demand. It should not be sold to speculators to be held for indefinite periods before cutting. The State can well afford to hold such timber better than any other agency, because it does not have to pay taxes on the timber or interest on the money invested.

The wide difference in prices received today compared with earlier sales amply justifies this position. Our first timber sales were made only twenty-five years ago. The following table divides this twenty-five year period into four sub-periods, showing the acreage sold and the price received during each period:

ber lands should certainly be taken into consideration relative to their value."

According to this report, three previous administrations, one of Governor McConnell and two of Governor Steunenberg, had attempted to sell at much lower figures than were received under Governor Hunt's sales. These sales of Governor Hunt averaged $5.18 per acre, or thirty to fifty cents per M for the State's best holdings. They were of the choicest State timber, and if sold at average stumpage prices in effect today, would bring a much higher price than can be obtained for any of the remaining State timber.

Over 100,000 acres of these sales were in North Idaho, a large percentage being white pine worth double the price of yellow pine stumpage.

Thirty-three thousand acres were in South Idaho, and it is stated on good authority that the footage of this timber was roughly esti-

**TIMBER SALES**

1901 to 1924, inclusive

| Time | Price | Acres | Average per acre | M. Feet | Average per M. Feet |
|---|---|---|---|---|---|
| *1901 to 1905 | $ 699,045.96 | 134,766.1½ | $ 5.18 | | |
| 1906 to 1910 | 526,260.47 | 38,523.11 | 13.64 | 303,113.00 | $1.73 |
| 1911 to 1918 | 383,526.38 | 35,847.68 | 10.69 | 189,714.00 | 2.02 |
| 1919 to 1924 | 1,804,713.59 | 37,617.24 | 47.99 | 480,645.24 | 3.75 |

*No appraisement in this office on sales made in 1901-05.

These sales were made on mixed timber and the prices given are the average price received on all species sold. At that time the members of the State Board of Land Commissioners felt they were receiving good prices, and fearing the loss the State might sustain by fire, they recommended that the timber be sold as rapidly as possible. Frank Martin, Attorney General and Ex-officio Secretary of the Board, in his report for the years 1901-1902 to Governor Frank Hunt, said:

"Persistent efforts to sell the timber lands of the State to create a source of revenue for the various state institutions were made during the administration of Governor McConnell and the two later administrations of Governor Steunenberg, but they were practically unsuccessful. The demand for the lands has been aroused within the past two years. Their sale, at much higher figures than previously demanded, has opened the way for large manufacturing enterprises in this state and has created a source of revenue hitherto unattainable.

"These chances in the disposal of state tim-

mated by purchasing parties, and based on their footage estimate, the timber would run around 60 cents per M, but actual mill scale shows the lumber ran about double the amount of the estimate.

Timber has gradually advanced in price from that day to this, as a comparison of the prices received in the first sales with those received in recent years shows. For example since 1919, we have sold 37,617.59 acres of timber at $3.75 per M, or an average of $47.99 per acre. This is $42.81 more per acre or nine times as much as was received in the sales made from 1901 to 1905. In addition to the price paid for the timber in our sales, we made a requirement of all purchasers that they pile and burn the brush and slashings, which represents an additional cost to the purchaser of from 75 cents to $1.50 per M.

In 1919, the State's policy of timber conservation began on its own lands, and has been successfully carried on for the past six years. This policy preserves and protects all timber from wasteful burning. On white pine

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# POSSIBILITIES OF PULP AND PAPER INDUSTRY IN NORTH IDAHO

BY ELERS KOCH
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The pulp and paper industry in the United States has never been as migratory as the lumber industry. Where the sawmills cut out region after region, and moved on to the next virgin territory, the pulp mills, with their more stable plants and greater investments, have hung on to their original locations near the great concentration of population, cleaning up after the lumber industry, utilizing more and more closely, cutting second growth and less desirable species, and shipping pulp wood supplies from greater and greater distances.

A compilation by the Forest Service (D. A. Bull. No. 1241) indicates in 1922 a consumption by the United States of eight million tons of paper, requiring for its manufacture 9,150,000 cords of pulp wood. Of this amount only four and one-half million cords were produced in forests of the United States, the balance being imported in the form of wood, pulp, or paper.

It is predicted that by 1950 the paper consumption of the United States will be increased to thirteen and one-half million tons, requiring fifteen to sixteen million cords of wood. Considering this probable increase in consumption and the rapid depletion of pulp wood supplies in the Lake States and the east coast, it seems inevitable that the industry will have to move westward with the sawmills, particularly for the supply of the mechanical-sulphite species, spruce, fir and hemlock, which constitute seventy-eight per cent of the requirements. It seems probable that the requirements for soda and sulphite pulp can be met for a long time from present producing regions and the South.

Just how rapid this inevitable westward move will be it is difficult to say. A stage has now been reached where many of the pulp and paper mills of the Northeast either have no timber of their own, or very limited supplies. The Canadian supply apparently will not fill the demand for pulp wood of the future. For the past ten years pulp wood imports have remained at substantially the same level, and with the rapid growth in the Canadian pulp and paper industry it has become evident that the Canadian requirements will in time absorb the source of pulp wood now being drawn on by the United States.

The Canadian Parliament has given the Governor in Council authority to restrict pulp wood exports. If such action should be taken it might greatly expedite the western movement of the industry in the United States. At any rate it seems quite certain that production of paper in the northeastern quarter of the United States will not be able to increase, and will probably show a gradual decline as the supply of pulp wood becomes scarcer and higher priced. The increased output, to meet the demands of a growing population, must, therefore, come largely from the West. Just how far the Inland Empire region will participate in the new industry remains to be seen. Alaska and the west coast have the advantage of cheap water transportation to the big consuming regions on the Atlantic coast, and will probably reap the benefit of the first extensive migration of the industry. It does, however, seem reasonable to expect that when shortage of production in the East compels an extensive movement of the industry to the westward, the Inland Empire region will be able to compete both with the coast and the Lake States in the Middle West market, much as is now done in the lumber trade.

Under conditions as they are to-day, the outlook does not seem promising for immediate development of pulp and paper plants in the Inland Empire. It may be assumed that a plant in Montana or Idaho cannot now get outside the field of the Rocky Mountain States for its market, and in most of these States competition must be met both from the coast and the Lake States. A rough calculation based on population, per capita consumption, and a division of the field with the competing regions has indicated a possible news print consumption of 36,000 tons as a maximum which could be supplied by an Inland Empire plant under present competitive conditions. Since the existing paper mill at Spokane has an annual capacity of about 25,000 tons it does not appear as though there would be room for another plant until changing conditions make it possible to extend farther into competitive territory.

A good demand for pulp wood in the white pine region of Idaho would solve the worst utilization problems of the lumberman and forester. Logging in north Idaho, outside the yellow pine belt, is, of course, built around the white pine. It is a region of high cost logging which only a valuable species like white pine has been able to justify. On lands owned by lumber companies, millions of feet a year of white fir and hemlock are left standing after the white pine is logged, most of which subsequently is burned up by slash fires. On National Forest timber sales, where the cutting of white fir and hemlock is required for silvicultural reasons, a loss of $3 to $7 a thousand on these species must be figured in the appraisal and deducted from the value of the white pine. An established pulp wood market at a price which would allow the logger a reasonable profit would make a tremendous amount of timber available which cannot now be handled at all.

From the standpoint of an ample and permanent pulp wood supply North Idaho offers a very promising field to the pulp industry. The best estimate available for spruce, white fir and hemlock show four billion feet in private ownership, two billion State, and seven billion National Forest timber. These estimates are probably low, since the species of little value are seldom given full consideration in estimating.

To a prospective paper manufacturer seeking a permanent investment the supply of National Forest timber is of more significance than private timber, since under the present rate of cutting the privately owned timber in North Idaho will be pretty well exhausted within a generation, while the National Forests, being managed on a sustained yield basis, will furnish a continuous supply. Since the National Forests are generally higher and more mountainous country than lumber company holdings, the percentage of pulp species, spruce, white fir, and hemlock, is considerably greater.

Considering a permanent supply of timber as the most essential requirement, there are three sections of Northern Idaho which would each offer the possibility of an adequate supply of pulp wood. These are the Clearwater region, the Coeur d'Alene Lake region and the Sandpoint region.

In some respects the Clearwater region holds the most promise for an extensive pulp industry in the future. There is an enormous amount of the pulp species, white fir, hemlock and spruce, on the Clearwater drainage, both in the National Forests and in private ownership. There is a vast forest of private and State-owned timber in Clearwater County, as yet almost untouched. Clearwater County is estimated to have in the neighborhood of eight billion feet of private and State timber, of which more than two billion is composed of the pulp species. The greater part of this is white fir, which reaches its optimum development in the Clearwater region.

The estimates for the National Forests in this region are very rough, since much of it is complete wilderness country. All of the Clearwater and Selway Forests are drained by the Clearwater River, as well as the northern part of the Nezperce, which is on the South Fork drainage. The best figures available for this vast country give slightly over five billion feet of pulp species, of which 1,800 million is spruce, 3,200 million white fir, and a comparatively small amount of hemlock. Most of this would now be classed as inaccessible, and much of it lies in very rough country. However, all three of the main forks of the Clearwater may be considered drivable streams and the greater part of this timber will eventually be available. I believe it can be conservatively estimated that a sustained annual yield of fifty to seventy million feet of pulp species could be taken from the National Forests tributary to the Clearwater. The growth of white fir on the Clearwater drainage is phenomenal, and with proper management and good fire protection this yield could be greatly increased in future.

Considering only the matter of timber supply, there is no doubt the Clearwater drainage offers a wonderful opportunity for a paper mill.

The Coeur d'Alene Lake territory is, of course, a much more developed timber-producing region than the Clearwater. There is already a paper mill established at Spokane which draws its pulp wood supply from various points all over North Idaho, from Canada, and as far east as the Kootenai Forest in Montana. A mill situated in the Coeur d'Alene Lake region would have the advantage of a ready log market from the lumber companies who have an excess quantity of white fir and hemlock logs. The private timber resources have been pretty heavily cut into, and while it is always dangerous to make predictions of this sort, it is probable that twenty-five years will see the lumber company holdings of this region pretty well exhausted.

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# FIRE RESISTANCE OF NORTHERN ROCKY MOUNTAIN CONIFERS

BY HOWARD R. FLINT
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Apparently very little has been done to determine the relative resistance of tree species to fire chiefly, perhaps, because there appears to be small probability that foresters can make immediate practical use of the knowledge after it has been attained. However, the influence of fire on the forests of this region is so great that, as management becomes more and more intensive, we can ill afford to overlook any such vital characteristic as fire resistance of the species with which we deal. In a region where forest management must necessarily be on an extensive basis for many years to come, it may well be that where other things are about equal some preference can be shown the fire-resistant species in our silviculture.

Some intensive studies on this subject were conducted by Dr. J. V. Hoffman (1) in his first work on Douglas fir fire problems in the Pacific Coast region. These studies dealt chiefly with the relationship between age, barkthickness, and killing temperatures. A brief and simple resume' of Doctor Hoffman's findings is cited for those who are interested.

Among the inherent characteristics which influence the fire resistance of the various species the following are clearly apparent:

1. Thickness of bark.
2. Root habit.
3. Resin content of bark.
4. Branching habit.
5. Stand habit.
6. Relative inflammability of foliage.
7. Lichen growth.

Perhaps there are other factors not so plainly apparent but these are the principal ones and some of them seem to be of relatively slight importance. Obviously the tree that is fire resistant in several of the habits or characteristics listed above has a great advantage over the one which is in several ways subject to injury.

The studies previously mentioned, conducted by Dr. Hoffman, clearly indicate the importance of bark thickness in protecting trees from the effects of surface fires. Doubtless it is the most important of all the factors mentioned above. The experiments show that "Douglas fir with bark four inches thick resisted without injury to the growing tissues inside, a heat of 900 degrees Fahrenheit applied for four hours; and that slash fires heated the trunks from 800 degrees to 1400 degrees Fahrenheit for periods of 5 to 20 minutes without harm. Trees 35 years old with bark 1½ inches thick were killed after 52 minutes and 15 year old trees with bark one-fourth inch thick were killed after 11 minutes in a heat of 900 degrees Fahrenheit. Young trees 8 years old with bark 0.15-inch thick were killed in 1 minute and 10 seconds."

A German investigator (2) reports that growing tissue (cambium) in trees is killed when heated to 54 degrees Centigrade (about 129 degrees Fahrenheit). Thus it appears that thickness of bark alone gives such trees as western larch, Douglas fir and western yellow pine a great advantage over many others.

Thickness of bark at the base of the tree varies greatly, and to a considerable degree directly with the age of the tree. The bark of a western yellow pine thickens very early in life, that of a Douglas fir is very thin in early youth and thickens moderately early. The bark of alpine fir thickens very slowly and never reaches great thickness. Thus most trees are poorly protected against fire in early youth but some develop protection early in life and others very late or to a very small degree only.

Many of our fires are surface fires or ground fires. This is particularly true of those that occur in other than the most dangerous times. In fires of this kind the tree with a deep or descending root system has a great advantage over one with a horizontal or surface root system. Here again, the western larch, western yellow pine and Douglas fir with their roots striking deeply into the mineral soil have a distinct advantage over trees like the western red cedar and western hemlock with their roots spreading horizontally just beneath a duff layer which frequently burns off with a considerable heat, leaving the shallow roots scorched and exposed in the top of a baked mineral soil. It is of course, true that the

1. West Coast Lumberman, Vol. 46, No. 551, page 60.

2. Heinrich Mayr, "Der Waldbau."

character or condition of the soil has considerable influence on the form of the root system of a given tree species. For example, Engelmann spruce in a poorly drained soil with an impervious clay substratum close to the surface will have an extremely shallow root system. A tree of the same species growing on a well drained slope but a few hundred feet distant will have a root system two to four times as deep, and accordingly will be much more resistant to ground fires. This seems to be true in a general way and in varying degrees of all species of conifers in this region. White fir (Abies grandis) growing on a moist bottom succumbs very readily to a creeping ground fire. White fir on the dry hillsides of the Clearwater River in Idaho is a fire-resistant tree more enduring than white pine and nearly equal to Douglas fir in degree of resistance. Thus any scale of fire resistance must be applied with reservation.

The resin or pitch of coniferous trees is properly recognized as an inflammable material. Its presence in the outer bark of a tree greatly increases the susceptibility of the tree to damage by fire. The thick corky bark at the base of old western larch, white fir and Douglas fir trees bear but little resin and represent one extreme in this respect. At the other end of the scale is lodgepole pine and alpine fir, both with bark that even on the lowest trunk may long retain its resin content. The age of the bark is an important factor in resin content. The young bark of Douglas fir or white fir usually bears numerous "blisters" or vesicles filled with resin. These dry out and the resin disappears as the bark becomes old, thus on the same indi-

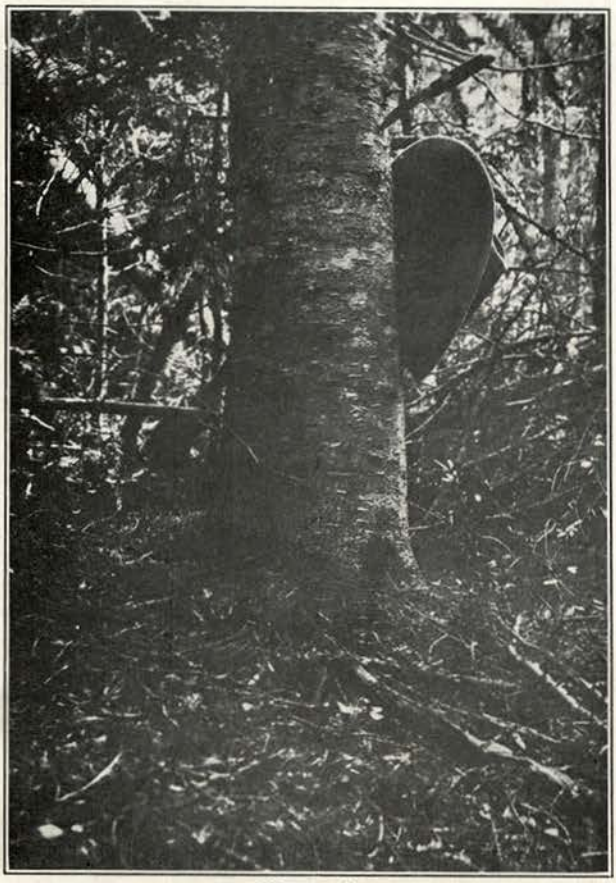

**Figure 1.**

Notice the thin bark with many resin vesicles. This is typical of **Abies lasocarpa.** The tree is about 100 years old, the bark only about one-fourth inch thick. Here is a bad combination; much litter, thin resinous bark, low-hanging limbs and dense stand.

Photo by Author

vidual the outer bark may be without resin at the base of the tree and very resinous on the new growth at the top. There also appears to be considerable individual variation in the resin content of the bark of trees of the same species and age.

There appears to be at least a casual relationship between what is known to foresters as "tolerance" or some of the characteristics that go to make up tolerance, and fire resistance. Generally speaking the intolerant trees of this region are highly fire resistant and the tolerant ones are of low resistance. The branching habit of intolerant species like western larch, western yellow pine and lodgepole pine is open and the trees usually prune fairly well, therefore, there is but little fuel on the lower part of the trunk to overheat it or to carry fire aloft. Engelmann spruce and alpine fir retain their lower branches for a much longer period and thus afford a ladder for fire to climb to the crown and a funeral pyre to roast the living tissue beneath the thin bark.

Closely related to branch habit is stand habit and consequently depth of litter or duff layer beneath the stand. Thus, stand habit has a more important bearing on the fire resistance of a species than is generally recognized. Its direct influence is on the spread and intensity of crown fires. All of the trees listed as of medium or low fire resistance with the exception of lodgepole pine and the possible exception of alpine fir are typically found in dense stands. They are subject in the highest degree to the conflagration danger, the totally destructive crown fire. Douglas fir and western larch are also occasionally found in dense stands but are much less typical of such stands than are the other species. A few high-headed old larches that tower above the dense stand, and a scalp-lock of Douglas firs on some dry, exposed ridge are often the sole survivors of a holocaust. This is largely due to a combination of fire-resistant features, but stand habit and branch habit play an important part.

It is a noteworthy fact that most, if not quite all, crown fires originate as surface fires or surface and ground fires. Indirectly, stand habit is a prime contributing cause to the heat and intensity of ground and surface fires. The most important part of the fuel of such fires in this region consists of litter and debris contributed by the stand above; fallen needles, dead twigs, naturally pruned lower branches, and the dead victims of keen competition for light and water. Clearly the denser the stand the greater the quantity of this sort of material cast down. The heavy duff layer furnishes fuel for a very hot fire to kill shallow-lying roots at once and to leave deeper roots exposed to severe and unaccustomed drying out. Strangely enough the effect does not end with the quantity of material which comes down. There is a further and perhaps an even greater effect in the slow rate of oxidation, decay, under such stands, due probably to comparative lack of aeration, light, and high temperature in such situations. Thus we observe that the duff may be three inches to six or more inches deep under a dense white pine stand, perhaps an inch under a western yellow pine stand and even less than that under a clean mature stand of lodgepole pine.

For the reason mentioned in the preceding paragraph the lodgepole pine with its roots entirely in mineral soil, with a minimum of fuel on the ground, and with an open stand habit not highly favorable to crown fires has several important advantages over western white pine with its thicker and possibly slightly less resinous bark. The placing of lodgepole pine above western white pine in the scale of resistance is, of course, debatable. Considering each tree in its typical stand the lodgepole appears to be the better survivor. Growing in mixture with white pine on a white pine site, as it not infrequently does, the lodgepole because of its thin bark appears rather less resistant than western white pine.

Inflammability of foliage is an important factor concerning which there has been a great deal of discussion and apparently but very little intensive investigation. A French writer Flammarion, (3) states that certain naturalists among the ancient Greeks regarded lightning as a kind of gum issuing from trees on dry days. It is a rather singular coincidence that some observers in this region refer to an exudation of highly inflammable gum from the leaves of conifers on dry days. Dr. James R. Weir of the Bureau of Plant Industry in an unpublished memorandum says, in part:

> "I find by microscopical examination that during unusually long continued droughts, not only does the entire epidermal covering of the leaves and young green twigs of pines, spruce and fir secrete more than the normal amount of a fatty wax-like coating in the form of rods or grains, but the inner surface of the guard cells exhibits a granular wax

3. "Thunder and Lightning": Flammarion. Translation from the French.

solution much above normal. An increased secretion of resin in the form of small drops is very noticeable on the leaves of western red cedar and juniper. Resinous secretions in the form of small papillae or rods are very noticeable at this (a dry) time on the young twigs of Douglas fir, spruce, fir and pine."

Further study of the question of inflammable resinous exudations from the leaves of coniferous trees might possibly yield interesting information concerning the inflammability of coniferous forests of various species at different times.

Some preliminary studies at Priest River Experiment Station indicate that the moisture content of living coniferous leaves is very high, probably 100% to more than 300% of the weight of the oven-dry material. This is to be expected because all living plant tissue is composed chiefly of water. Young leaves have been found to have a substantially higher moisture content than older ones, but it seems not to have been demonstrated that coniferous leaves contain substantially less moisture in midseason during a dry than during a moist period. Although it may not have been demonstrated experimentally it seems probable that leaves such as some of those on a fir tree, that have been on the tree for several years contain considerably less moisture than those of the larch which are never more than five months old. Possibly this is another factor in the high fire resistance of

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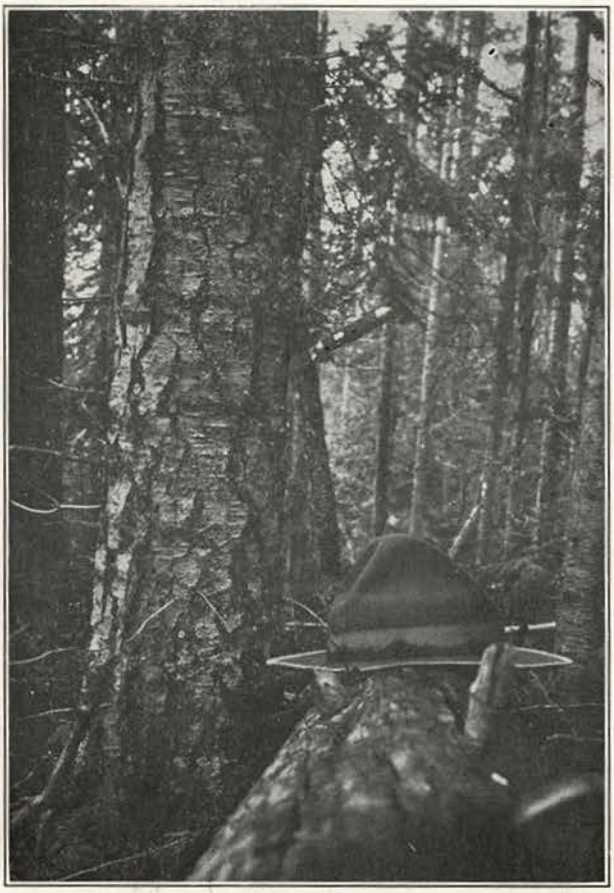

**Figure 2.**

This tree is a white fir, **Abies grandis,** of about the same age and size and only a few feet distant from the tree in Figure 1. Observe the hard bark more than a half inch thick. The resin vesicles have nearly disappeared. Except for bark thickness fire conditions are practically identical with those shown in Figure 1.

Photo by Author.

# PROFESSIONAL ETHICS AS APPLIED TO FORESTERS

H. H. CHAPMAN
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Without some kind of an understanding of what it's all about, the forester in attempting to formulate his ideas on the ethics of his profession may end up with the belief which was said to have actuated the ancient Israelites at one stage of their national and religious development. "Every man did that which was right in his own eyes." Yet long before this period they had adopted, in the Ten Commandments the foundation of an ethical code which superseded the stark savagery of ancient civilization; and which Bolshevik Russia has in the 20th century rejected root and branch, thus reverting to pre-Mosaic standards.

The plain facts are that individual standards of right and wrong as illustrated in Doug Fairbanks' Thief of Bagdad's motto, "What he wanted he took," are neither a sufficient nor an efficient basis for safeguarding or advancing civilization.

The definition given to ethics by a recent writer(1) is "Practices are ethical if in the long run they make for the well being of the human species and for normal human relations. If there is friction and social loss it is a sure sign of unethical conditions." Looked at in this way, ethics is seen to be the expression of the common effort to secure the common welfare.

The common welfare, secured by common effort! Yes, but how about the individual? Individual initiative, striving for self advancement sometimes termed "enlightened self interest" is probably the most powerful of all the forces which make for the economic progress of society. Again we have the example of the Bolsheviks to prove the consequences that follow the crushing of this impulse and the substitution of state or governmental direction of every activity, resulting in paralysis and destruction.

Since Bolshevism's failure lies above all else in the rejection of every trace of ethical principles, both in personal conduct and in public affairs, this example may not only emphasize the real service performed by ethics, but point out the essential character of the principles themselves.

The common welfare is sought by Bolsheviks, in theory, by "common" effort—the very basis of their creed is "communism"—hence the miscarriage of their efforts must lie in failure to recognize basic forces in human nature which, if outraged and violated, bring any doctrinaire system to ruin.

This brings us squarely up to the problem, how is the common welfare best attained? Certainly it is easy to destroy it, just as a child can wreck the most intricate machine by a single well directed pass with a monkey wrench. But society is not an inanimate creation and is capable of fighting back, and suppressing its would be "saviors" as well as its deliberate enemies, just as the body subdues invading "red" germs, or the parent restrains the mischievous child.

Apparently and here I think lies the kernel of the matter, it is necessary in order to secure a progressive, orderly and beneficial state of society, that both of the two great forces which actuate men, individualism or freedom of initiative on the one hand, and collectivism, or the police power of the state, on the other, be respected, preserved, and harmonized. By the proper balance or tension of these forces, society and human nature are literally lifted up to higher levels. But the comprehension of a complex or tension—the idea of forces constantly in a beneficial struggle or opposition—is too much for the embryonic, caveman intellect, which in its immaturity demands one final and positive solution of all human ills, which, if they succeeded in getting it, whatever it is, would spell death, by terminating the healthy reactions necessary to continued life.

With this conception of the tension of individual and social forces as a starting point it is easy to see where Bolshevism has gone wrong and what we mean by ethics. Either of these forces, if it becomes paramount, becomes in that measure destructive, as certainly as does electricity when the balance between air and earth is disturbed. Rampant individualism means selfishness enthroned. Whatever form this takes, it is evil in its effect, not only on others but on the individual himself. There is not a form of lawlessness, crime, abnormality or to use the former phrase, "friction and social loss" but can be

1. Hermance, Edgar L.—Codes of Ethics.

traced to over developed egotism of individuals. The essence of selfishness is its tendency to gratification at the expense and to the harm of others—hence it tends in turn to restrict human liberty and substitute force for justice and equality. Then by an easy transition we find individuals who hold that their opinions are wiser than those of the remainder of mankind, super egotists like the old Spanish inquisitors, and like Robespierre and his modern Russian successors, employing tyrannical force to crowd these opinions down the throats of the world, prostituting the state to their despotic purposes and centering the organized forces of society in themselves to crush the individualism of common humanity, thus bringing the vicious circle to completion.

"The end justifies the means" is the shibboleth of the egotist and fanatic. Ethics has no place in his creed. We must formulate something better—How would this do: "The greatest amount of individual liberty commensurate with the common welfare." Here lies the possibility of preserving the balance, permitting each of the two great forces to contribute its share of positive or negative electricity, restraining the individual only when it is shown that such restraint is necessary to prevent social friction and loss, supplementing rather than supplanting private industry, proceeding on the basis of experience, by correction of past mistake, to evolve a better balance or tension, and to ease the strains and supply oil as well as "gas" to the machine.

Without any question, ethics, and ethical principles are the working rules which make this result possible and as such, are more important to society than vitamines or gland secretions in controlling the human body. They may be elusive and hard to formulate, but we can detect the results of their absence!

Ethics, as such, may exist as an acceptance of common ideas, voluntarily observed, as are many social customs of whose violations we speak in the phrase "It isn't done." In whatever form, whether written or not, whether enforced by a responsible body or left to the force of public opinion, a code of ethics is always a deliberate interference with individual freedom, aimed at any practice which tends to injure others besides the offender.

Professional ethics embodies those principles which should be observed by the members of a profession, in their professional contacts with each other and with the public, in order that the actions of a member of this profession may not bring the profession itself into disrepute with the public and hence harm every member in it as well as the offender.

The members of any profession have an absolute right not only to formulate a code of such ethical principles but to enforce it by any means which is most effective. Such a code and its enforcement are one of the chief services which a professional society can render to the profession which it represents.

It is obvious that this code should not seek to duplicate matters dealt with in common law. Naturally, if a man proves to be a thief or murderer this may also carry with it professional ostracism or expulsion from a society. What such a code should deal with are practices not covered by the criminal code, but which hurt the profession itself by diminishing its reputation, undermining the confidence of the public, and thus lessening its ability to give professional service.

Different branches of the forestry profession meet different problems. Foresters in the employ of the U. S. Forest Service for instance have a very well defined informal code, based on the standards reiterated by Pinchot and his successors and assistants and circulated by word of mouth and by departmental communications. They have lived up to this standard, based on public service, to such good effect that public confidence has completely replaced the original attitude of suspicion and distrust and this confidence is what makes the work of the Forest Service possible with so relatively inadequate a force as is at present maintained through a mistaken policy of economy or penury which prevails in the Department. Should this standard fall, public confidence would quickly disappear. Practically the same general code applies to state foresters, though the latter have occasional difficulties through not being automatically protected from the ravages of politics. In a few feeble efforts that have so far been made to formulate a code for foresters as a whole, it is evident that private forestry practice comes in for the greater portion of attention, indicating that this field is less clearly defined, and is more apt to cause trouble in reaching an understanding.

If professional ethics consists of principles intended to restrain individual selfishness from acts detrimental to the profession, we can elaborate the theme a little farther. What sort of acts is detrimental to a profession?

(Continued on page 43)

# AN EXPERIMENT IN FORESTRY

BY TOM JACKSON '19
Woods Superintendent, Fruit Growers Supply Company, Susanville, California.

The Fruit Growers Supply Company, a subsidiary organization of the California Fruit Growers Exchange, owns approximately 40,000 acres of timber within or adjacent to the Lassen National Forest. A few years ago this company added to its timber holdings by a purchase of timber from the U. S. Forest Service on the Lassen National Forest. It may be added that this sale was one of the largest the Forest Service has ever made.

By agreement the holdings of the Supply Company together with those of the Forest Service, covered by the sale were put under management with a view to giving the Company a perpetual supply of timber. The management plan provides for a seventy year cutting cycle. The Forest Service manages its holdings thru the man in charge of timber sales, and the Supply Company thru its forester, Mr. Herman Baumann, a graduate from the School of Forestry, University of Idaho, class of 1924.

Actual operations under the plan began in 1920. The first unit covers approximately 100,000 acres of government timber and 20,000 acres of Company timber. During the first few years of the operation the largest percentage of the cut will be on Company land but later the bulk of the logging will be done in government timber. The plan calls for a cut of from twenty-five to fifty million feet of timber per year from the Forest Service Sale.

The first unit runs about 70 per cent yellow pine, 25 per cent white fir, with a scattering of sugar pine, lodgepole pine and incense cedar. The whole area is a fair logging chance. It was originally estimated that about 50 per cent of the area could be logged with horses and high wheels and the remainder with donkeys. The fire hazard is greater in this unit than in the average pine stand due to the high percentage of white fir and white fir reproduction.

The Forest Service handles this sale in a manner similar to that of other government timber sales. The areas to be logged by horses, donkeys or other methods are specified. All timber to be felled is marked. This includes snags and diseased trees to be felled after logging. They supervise all phases of the logging, watch the height of stumps, manner of falling, and keep close check to see that no timber is left which should be logged. They watch that the lines in donkey logging are layed out so as best to protect young growth.

To date above 75 per cent of the logging has been done with horses and high wheels. This method is preferred over donkey logging by the Service as it injures less of the reproduction and leaves the ground in better shape. In fact the sales contract specifies that steam logging will be permitted only on areas where it is clearly impracticable to log with horses. However, caterpillar or tractor logging is coming into favor with the Service as they estimate that much of the reproduction which is swamped out to make roads for the horses would be left if the same area were logged with tractors. The local Forest Service officials advocate the replacement of all our horses and a large percentage of the donkeys with tractors.

It is obvious that the two big features of forest management as it is practiced in this country at present are: Regulation of the amount and quality of timber left in logging as a reserve crop and fire protection. Naturally it is these that the Service concentrates on. The sales contract calls for at least 70 per cent of the merchantable timber to be marked for cutting which gives an option of leaving 30 per cent. On the better stocked areas which cruise around twenty or twenty-five thousand feet to the acre this means a reserve of from six to eight thousand feet of merchantable timber. Cruises of cut-over Forest Service lands show this amount left. Care is taken by the officers who do the marking to see that in the mixed timber a large percentage of pine is left. They try to make the reserve over 50 per cent pine.

Brush disposal, an item of fire protection, is closely supervised by the Service, and the requirements on this sale are quite strict. The Service issues cards of instructions for brush piling, defining the size and shape of the piles, their location, distance from live trees and size of limbs allowed in the piles. The Service attempts to burn all piled brush which is sufficiently dry, each fall after the first snow. All snags and diseased trees are felled along with the brush piling as the limbs of these trees have to be piled for burning.

The labor cost for piling brush and falling snags, aside from supervision runs from 40 cents to 80 cents per M. ft. of logs in the mixed type of timber. In the yellow pine type it is much less.

The Forest Service frequently inspects and reports on our fire protection system but the burden of fire protection and suppression falls on the Company. The Company is governed both by Forest Service regulations and state laws in its fire protection. The main requirement of both are the clearing out and burning of all debris within one hundred feet of all donkey settings, equipping each donkey or engine with a force pump, two hundred feet of hose and a box of fire fighting tools, the maintaining of fire patrolmen, watchmen at the donkeys at night and noon hour, use of oil only in locomotives, and the maintaining of efficient spark arresters on all wood-burning engines.

The Forest Service maintains lookouts covering the entire sale area. Lookout points and our camps are all connected by telephone. The Company and Forest Service have a cooperative agreement whereby, for so much per acre, the Company gets lookout service and aid from any forestry officials who are present in fire suppression on Company lands. According to the sales contract the Company pays all expenses for suppressing fires within the sale area.

The Company forester is head of the fire protection and suppression organization and responsible for its equipment. He has from one to three patrolmen during the fire season. In addition to the equipment required by the state and Forest Service the Company keeps a box at each camp containing forty or fifty shovels and a proportionate number of axes and other tools and at headquarters, two pumps and one thousand feet of two inch hose, to be used in connection with water cars. With this equipment, water under pressure can be taken to a fire within one thousand feet of any railroad spurs.

The following poster outlines the Company's policy toward forestry:

It is the policy of this Company to log its own land in such a way as to leave and preserve the small trees and to leave the cut-over land in such a condition that a second growth will be obtained.

In order to obtain this result it will be necessary that:

**Fallers:** Will fall no trees under twenty inches in diameter, unless defective or marked for cutting.

Will avoid as far as possible the breaking of young trees when falling.

Will cut all stumps at a maximum height of eighteen inches above the ground.

**Hooktenders:** Will set their lines so as to avoid groups of young trees and pole timber.

Will place bushings under straps when slinging blocks on small trees that will be left.

Will log so as to prevent any unnecessary damage to the remaining stand.

**Swampers:** Will pile brush in open spaces away from standing timber that will be left after logging so that this brush can be burned without injury to the remaining stand.

For the first year or two fallers were instructed to leave a certain amount of merchantable timber. Lately the forester has been selecting and marking the trees to be left. On a recruise of over three thousand acres of cut-over land, logged mostly in 1921 and 1922, there were found to be an average of 834 feet per acre of merchantable timber left as a reserve. This included only sound, healthy trees over twelve inches in diameter. From yield tables and growth studies made on similar areas it is estimated that the Company could cut four thousand feet per acre from this land in seventy years. A recruise of 320 acres logged in 1924 showed an average of 1567 feet per acre of reserve timber.

The Company has done considerable experimenting in the past few years in an endeavor to work out a system whereby it could handle its lands from both a forestry and business standpoint. It has piled and burned brush on strips along railroad spurs and wagon roads and other advantageous points as fire protection precautions, and has maintained and up to date protective organization. However, since timber on the eastern slope of the Sierras is a slow growing crop, the Company is doubtful whether it can handle its timber lands as the Forest Service handles similar lands and show a satisfactory profit. From the data at hand, it would seem that the Company could practice forestry and realize from two and one-half per cent to three per cent on its investment.

# PRODUCTS FROM IMMATURE WHITE PINE STANDS IN IDAHO

BY J. A. LARSEN
Assistant Professor of Forestry, Iowa State College

In northern Idaho there are many immature stands of white pine and other species which can be made to yield both material and financial returns to the owner from thinnings. Many of these young forests are close to the market thus making the material readily salable as cordwood, railroad ties, fence posts or fence rails, mining stulls, props or lagging. In some instances the trees may be sold as match stock, bucket stock or box shooks, etc. The utilization of such young stands will also diminish the drain on higher grade material. The thinning of such young forests will be of great benefit to the trees which are left by speeding up the growth, for trees, like any other growing crop are apt to seed in thickly and come up altogether too dense so that most of them are retarded in growth and development.

The purpose in this brief article is to show what products can actually be cut from one such immature forest in northern Idaho. The data were obtained at Priest River Forest Experiment Station. In the vicinity of that station are eight permanent half-acre plots which are devoted to thinning experiments, four of these were begun in 1914 and four in 1919. On these plots thinnings were made in different degrees, that is, on some plots a heavy thinning was made with the object of giving the remaining trees plenty of room for later growth and development while on other plots only light or medium thinnings were made. The age of this stand when thinned was 60 years. Since it is altogether out of the question to present here all of the data obtained on these plots it is thought best to limit the figures to one or two representative or average plots. I am therefore giving the data for two plots of medium thinning; the first table showing the trees of different species and diameters removed and remaining on one of the 1914 plots and the second table the allocation of the material according to products on one of the 1919 plots. It should be stated that the largest trees are about 90 feet in height and 16 inches in diameter outside the bark. Most of the trees are from six to ten inches in diameter and from 60 to 80 feet in height.

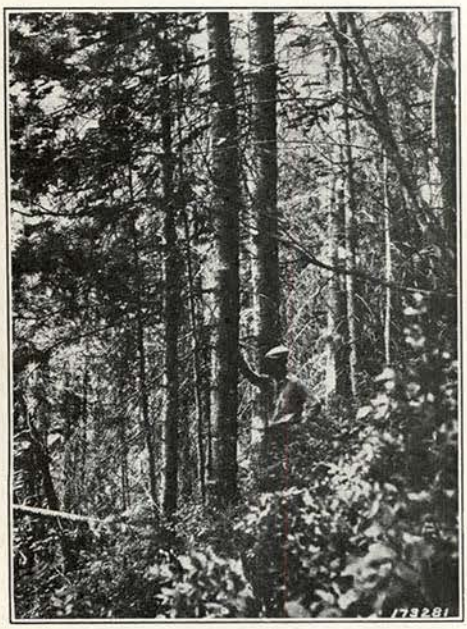
The plot from which figures for table 1 were obtained is on a bench of average elevation of Priest River Valley at 2,300 feet. The stand contained relatively much larch, and the plot whose figures appear in table 2 lies in the narrow valley of Benton Creek,

**Table I**
**Trees removed from ½ acre plot in a 60-year-old forest in northern Idaho**
**Medium Thinning**

| Species | W. White Pine | | | Western Larch | | | Douglas Fir | | | Miscellaneous | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diam. Breast High, Inches | No. Trees Cut | Height in Feet | Vol. Cut cu. ft. | No. Trees Cut | Height in Feet | Vol. Cut cu. ft. | No. Trees Cut | Height in Feet | Vol. Cut cu. ft. | No. Trees Cut | Height in Feet | Vol. Cut cu. ft. | No. Trees Cut | Vol. Cut cu. ft. |
| 1 | 17 | 16 | 3.91 | 35 | 22 | 5.3 | 3 | 17 | 0.5 | | | | 55 | 9.71 |
| 2 | 54 | 24 | 8.64 | 71 | 33 | 32.6 | 10 | 21 | 4.0 | 5 | 23 | 2.0 | 140 | 47.24 |
| 3 | 39 | 31 | 34.70 | 64 | 41 | 55.7 | 7 | 26 | 6.8 | 2 | 29 | 3.4 | 114 | 100.40 |
| 4 | 12 | 36 | 22.70 | 26 | 44 | 37.7 | 1 | 30 | 14.2 | 2 | 35 | 3.1 | 41 | 77.70 |
| 5 | 5 | 44 | 13.75 | 14 | 55 | 38.5 | | | | 3 | 43 | 13.8 | 22 | 66.05 |
| 6 | 1 | 60 | 6.23 | 10 | 64 | 49.0 | | | | 2 | 55 | 9.9 | 13 | 65.13 |
| 7 | | | | 3 | 75 | 20.7 | | | | | | | 3 | 20.70 |
| 8 | 1 | 70 | 8.84 | 7 | 75 | 18.2 | 1 | 35 | 4.6 | 1 | 80 | 12.8 | 10 | 44.44 |
| 9 | 1 | 80 | 15.25 | 1 | 75 | 11.7 | | | | 3 | 85 | 48.6 | 5 | 75.55 |
| 10 | | | | | | | | | | 1 | 85 | 19.1 | 1 | 19.10 |
| Totals | 130 | | 1140.02 | 231 | | 269.40 | 22 | | 29.9 | 21 | | 112.7 | 404 | 526.02 |

*Volume of entire peeled stem.
The total number of trees on this half acre was as follows: White pine 246; Western Larch 342; Douglas fir 23; miscellaneous hemlock, cedar, etc., 25.
Total trees per half acre 636.

a small tributary of Priest River. From the figures in table 1 it is seen that about one-half the number of trees were removed in the thinning. Naturally the mixed species such as larch and Douglas fir were cut heavier than the white pine. The actual removal showed 52 per cent by number of white pines, nearly 70 per cent of the larch, 96 per cent of Douglas fir and 95 per cent of miscellaneous species. The percentage in volume removed by the thinning is much lower than that shown by the number of trees for the reason that as many as possible of the small trees were cut, reserving the larger ones.



A sixty-year-old forest of western white pine and mixed species in Idaho, which will yield good returns from thinnings. Such thinning out of the inferior species and slower growing trees will result in increased growth of the trees left to grow for saw timber.

The data given in table 2 show that products are obtainable from such young forests by thinning. (These figures were worked up from one of the 1919 plots. This shows more trees per acre in the original stand than the 1914 plot used in table 1 but fewer trees were removed than in the case of the 1914 medium thinning.)

From the data in table 2 it appears that one-half acre of sixty-year white pine timber will yield 987 cubic feet of material from a medium thinning. That is, a thinning which removes about one-half of the number of trees and which leaves about 400 trees per acre. The products obtainable will naturally vary according to the species for the more larch and Douglas fir the more railroad ties will be obtained, and the more lodgepole pine and yellow pine the more mining timber or cordwood can be cut. Not infrequently there are old snags from the previous forest which will help swell the cordwood measure. If we allow an average selling price of 20 cents per stull, 25 cents per tie, 5 cents per fence post, 2 cents per fence rail or lagging, $3.00 per cord and $5.00 per thousand board feet for bucket stock or match stock, we will have a gross return of $50.50 per one-half acre or $101.00 per acre.

Perhaps the best part of the transaction is the increase in growth and quality of the trees which have been given more growing space after the thinning. This increase in growth as a result of the thinning will be discussed at some later date.

The thinnings referred to in this article are conservative, that is, they may be considered comparatively light, not removing as many

(Continued on page 45)

**Table 2**

**Products which can be harvested from one-half acre of 60-year-old white pine forest in northern Idaho**

| Species | No. Trees | | Total Vol. Cut cu. ft. | No. Studs Cut 14 to 16 feet | No. ties cut 8"x7"x7" | No. Fence Posts cut 7'x5" | No. Mining Props cut 16'x5"+ | No fence rails 16'x3"+ | Bucket Stock bd. ft. | Cordwood @ 58 cu. ft. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Cut | | | | | | | | |
| White pine | 220 | 86 | 234.47 | | | | | | 300 | 3.21[4] |
| W. larch | 27 | 16 | 148.80 | | 13 | | | | | 1.76 |
| Douglas fir | 112 | 98 | 301.20 | 8 | | 172 | | | | 2.22 |
| Misc. | 120 | 79 | 303.13 | 16[3] | | 19[2] | 17[1] | 14 | | 2.55 |
| Total | 479 | 279 | 987.60 | 24 | 13 | 191 | 17 | 14 | 300 | 9.74 |

1—Lodgepole pine.
2—Yellow pine.
3—Lodgepole and yellow pine.
4—The number of cords includes timber to tips.

# SOME METHODS USED IN GRAZING STUDIES

C. L. FORSLING, Director, Great Basin Range Experiment Station

Systematic grazing studies on range lands have been under way since 1907. A number of problems had been given considerable study by several investigators prior to that time, but it was not until grazing studies were started on the National Forests in the West in 1907 that organized activities in this field had their beginning. Since that time projects have been undertaken by the U. S. Department of Agriculture, a number of the western State Agricultural Experiment Stations, and by private organizations. The most extensive work since 1913 has been carried on at the Great Basin Range Experiment Station in central Utah. During the eighteen years that have intervened there has been consistent progress in the development of methods for conducting grazing studies.

### The Object of Grazing Studies

The purposes of grazing studies are twofold. The primary object in their undertaking was to develop methods of grazing use and handling livestock to obtain the highest and best use of the forage crop consistent with the perpetuation of the forage and related resources. In the early days of the range livestock industry, when there was an abundance of range and cost of production was comparatively low, but little attention was given to how the forage resource was used or conserved. This led to a decline in productivity on large areas. As the industry spread to all the available grazing lands and cost of production began to climb, there arose a need for more efficient utilization of range forage. The pioneer range investigator, therefore, found a comparatively new and broad field of work. Although good progress has been made during the brief period that range research has been under way, the field is still comparatively new. There are many recognized problems which have not been given much attention because of the limited time and money which is being devoted to range research. As conditions surrounding the livestock industry change, better methods of range management will have to be worked out to meet them. Development of improved methods of range use, therefore, remains one of the main objects of grazing studies.

Results already accomplished in range research have shown that regulation of the number of animals grazed, correct grazing season, better methods of handling livestock on the range and provision for natural revegetation of the native forage plants are essential to maximum forage production and its best use. The successful livestock producer, therefore, must adjust the period of grazing and numbers and methods of handling his livestock so that no injury to the range will result and overgrazed areas may improve. The proper adjustments to apply in the present use frequently are not obvious to inspection. Changes in the forage cover are often so slow that they are imperceptible to the eye; yet if allowed to continue over a period of years they may result in a material decline in yield. However, such changes are revealed by careful study. Consequently, a second purpose of grazing studies is to determine the effect of current use upon the range, in order that adjustments in its management may be made upon a sound basis.

### Grazing Management a Problem of Ecology

Grazing management is essentially a problem of plant ecology. Plant ecology treats of the response of a plant, or group of plants, to the factors of the habitat, such as soil, moisture, temperature, animal life, etc. Grazing animals are a factor of the habitat, so to speak, and the object of grazing management is to control this factor in a manner that will not interfere with the renewal of the forage crop year after year. All of the factors of the habitat, other than the grazing animals themselves, play an important part in the final outcome in forage production. Although the grazing student is primarily concerned with proper control of grazing animals, it is necessary for him to know the effects of the other factors in relation to grazing before the effect of grazing alone may be understood.

Since grazing management is largely an ecological problem, ecological methods are used widely in grazing studies. Some revision of the methods ordinarily used by plant ecologists have been found necessary in order to adapt them to the needs of grazing studies and a few special methods have been developed. On the whole, however, there has been no great deviation from ordinary research methods in ecology.

**Changes in Plant Cover**

Changes are continually taking place in the composition and density of the plant cover in response to changes in any of the various factors which influence or control plant growth. A number of publications, including most text books on ecology, deal with this subject. One of the more recent and most exhaustive treatises (1) is listed at the close of this article. These changes are occurring regardless of whether there is use of the vegetation by man for grazing livestock or for other purposes although grazing, and more particularly improper grazing, is usually the dominant factor on pasture lands. An understanding of these changes in plant cover is a prerequisite to proper range management.

The normal trend of the change in plant cover is positive, or from a lower to a higher plant type, the final form of which, if there is a final form, is called the **climax.** This following of one group of plants by another group of a higher scale is called **plant succession.**

The plants themselves are the most influential cause of plant succession. When a lower form of vegetation occupies an area for a period of time it changes a number of the growing conditions directly or indirectly such as structure, fertility, moisture-holding capacity and temperature of the soil, and atmospheric and light conditions near the surface of the soil. These changes make possible the support of a higher type of vegetation and new species of the higher type slowly invade and crowd out the plants of the lower type. Each successive wave of vegetation makes way for another higher form until a fairly stable type is eventually reached.

Factors other than the successive plant invasions may cause changes in the plant cover. These include biotic factors, such as man and animals, deposition or erosion of the soil, climatic factors to some extent and lightning and man-caused fires. These factors may work to aid or hinder normal plant succession. Erosion, for example, may improve the soil by weathering down the rocks and coarser materials. On the other hand, running water or wind may remove the best part of the soil. Grazing animals may operate favorably through addition of humus and in the dissemination and planting of the seed, or in the opposite direction, to destroy the occurring vegetation. Any change in climate will improve or impoverish the growing conditions, depending upon the character of the change. All of the factors work together and the final outcome is the result of the complex of these processes. Some factors may operate to offset to a greater or less degree the favorable result of others so that the present plant cover is the result of the dominant factor or factors operating in one direction.

It follows, therefore, that the order of things in plant succession may not always be progressive or in a positive direction. Certain factors, such as grazing animals, fire, and removal of soil by erosion and adverse climatic conditions may slow up or prevent positive succession, may go so far as to cause a type to revert to a lower form of vegetation, or, if severe enough and extended over a sufficient period, may result in complete denudation. The turning back of succession is often called **retrogression** by ecologists. Positive succession, or the process of building up toward the climax type, is resumed as soon as the disturbing factors causing retrogression are overcome.

Grazing management may be said to be concerned with the control of grazing animals in order that they will not cause retrogression, but wherever possible an increase in the palatable vegetation. The phases of vegetation which occur in retrogression, due to uncontrolled grazing, processes in succession which follow adjustment of grazing for certain plant types, and certain other disturbing factors have been described by various authors, including Sampson (2), Clements (3), Jardine and Anderson (4), Jardine and Forsling (5), and Shantz (6).

The chief factor other than grazing with which the grazing student is concerned is climate. Fire, which is usually accidental, and certain man-caused factors, such as logging and cultivation, may enter in at times, but they are largely local in nature. Climate in the aggregate does not change over a period of years, although there may be variation over several centuries. (Huntington (7) and others.) There may be fluctuations one season with another, however, and these are the ones with which the grazing student is concerned.

Even the most casual observer has noted variation in annual rainfall, for example. A period of one to several years with rainfall below the average may be followed by periods with moisture conditions that are average or above. These fluctuations may cause the density of the vegetation to vary as much as 50 per cent or more (6), and cause a temporary

change in the composition of the vegetation. Grazing must be regulated in accordance with the decline in amount of forage species due to adverse climatic conditions. Otherwise, there may be deterioration of the range due to the over-grazing that would result on account of subnormal forage productions. Variations in other climatic factors may affect growth in a similar manner.

**Determining Changes in Plant Cover**

Since the change in plant cover is of such great significance in the proper control of grazing, the grazier and the investigator are immediately concerned in what these changes are and how they may be determined. Determining them constitutes a major portion of grazing studies.

**The Permanent Sample Plot**

The permanent sample plot is the basis for studying change in vegetation. Comparison of records of the amount and character of the vegetation on such plots, obtained at suitable intervals, will show whether the plant cover is improving, holding its own or declining in amount and quality. It is impractical to determine with any degree of precision the change that may be taking place over the whole of a unit of range because of the immense task involved. Estimates of the density and composition of the vegetation on the range by plant types by experienced investigators are valuable to show the general changes over a period of years, but are inadequate to show the detailed variations with the accuracy required, or to show changes over short periods. Changes, except where there is gross misuse, are usually so slow as to be inappreciable to the eye. The best plan, therefore, is to select one or more permanent plots upon which to make detailed studies. If representative, the results from such plots may be applied elsewhere wherever conditions are similar to those on the plots.

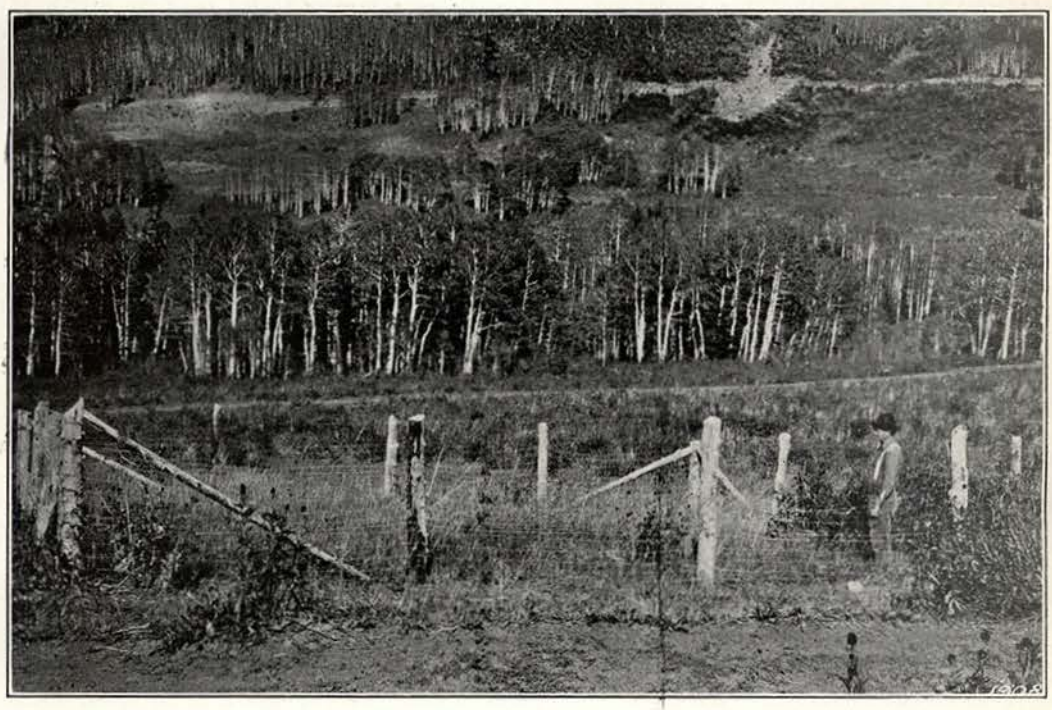


**Fig. 1.** A sample plot fenced to exclude livestock. Plots of this nature are of value for checking the results on open plats, and for showing the potential productivity of the range.

Sample plots must be permanent if they are to serve their best purpose. The same area must be compared time after time over a period of years if the actual sequences in vegetation are to be shown. Temporary plots are of value for studies that may be complete in a short time, but where the object is to determine the trend of both the quantitative and qualitative changes in plant cover the same plots must be available throughout the per-

iod of an experiment or the time of use of an area for grazing purposes.

**Kinds of Sample Plots**

There are three general kinds of sample plots commonly used in grazing studies. They are (1) the open plot, (2) the protected plot, (3) the hurdle, or partially protected plot. Ordinarily two or more of these are used in combination.

**The Open Sample Plot:** The **open** sample plots are those located on the range subject to grazing. The records for such plots will show quantitative and qualitative changes in plant cover on account of grazing, **together with the other factors of the site.** They are incomplete in themselves, therefore, to show the effects of grazing alone or the potential productivity of the range. They will show, however, whether the range is improving or deteriorating, which information is often sufficient for deciding whether present use is harmful or satisfactory. Protected sample plots for use as a check against the open plots are necessary for arriving at more conclusive results.

**The Protected Sample Plot:** Protected sample plots are those located within enclosures or areas fenced to exclude livestock (Fig. 1). They are subject to all the other conditions of the site except grazing. Their history, therefore, will show the changes in vegetation on account of the factors other than grazing. By correlating the results obtained on an open plot with those from a nearby protected plot, it is possible to arrive at the effect of grazing on the open plot to a fairly accurate degree. Moreover, it is frequently quite difficult to ascertain what a given site is capable of producing when no records of past conditions are available. Protected plots which have been established for a number of years so that the vegetation will have had an opportunity to grow undisturbed by livestock will serve as a check to show the vegetation that a range is capable of supporting when undisturbed. Protected plots established contemporaneously with open plots will serve as a check on whether or not the open range is improving as rapidly as might be expected.

The size and construction of enclosures depends upon the purpose of the sample plot and the building material available. Cost usually governs the maximum size, and the area required to obtain representative conditions determines the minimum size. The enclosure should be large enough so that light conditions, air movement and precipitation are not changed on the sample plot. An area 33 feet square, where pole or wire fence is used, is about the smallest plot that can be used without interfering with growing conditions. Larger protected areas are advisable when facilities permit their construction. Where timber is available, pole fences can usually be constructed at the smallest cost. On the other hand, where transportation is a factor, barbed wire, woven wire fences, or a combination of the two is ordinarily the cheapest and the best material. Fences should be well built, be adequate to exclude all classes of stock which may use the range, and be kept in good repair. In localities where snow attains a depth of three feet or more, wire fences that can be dropped to the ground and replaced again in the spring or pole fences should be used.

**Hurdle Enclosures:** The **hurdle** enclosed sample plot is one enclosed with a removable fence. They are used for studying the effect of various modifications in the time and degree of grazing. The investigator frequently desires to try out some new method of grazing or to determine the application of some system, the principles of which have already been worked out. The usual empirical method of this purpose is to graze a number of areas in accordance with the system that is being tested. The cost incident to handling livestock on a number of such areas is often greater than the available time or money will permit. Such systems of grazing may be studied on a range used continually under one system, with the hurdle enclosure. The fence is placed about the sample plot or removed in accordance with period of use or degree of grazing that the study plan calls for.

The hurdle plot method is especially adapted for determining the time when grazing may begin in the spring without injury to the vegetation from too early use, and the application of deferred and rotation grazing. In studying the opening of the grazing season, for example, several hurdle sample plots and one or more open plots are established on the range. These closed plots are opened to grazing one by one at intervals of several days to a week beginning shortly after the opening of the grazing season, and are then grazed the remainder of the season. This is repeated with the same plots for a number of years and the data will, when correlated, give the basic information for determining the proper date of beginning the grazing season. In a

(Continued on page 45)

# YOUNG STANDS OF WESTERN WHITE PINE PROGRESS REPORT

C. W. WATSON
Assistant Professor of Silviculture, School of Forestry, University of Idaho

As a result of old burns in north Idaho there have sprung up many stands of white pine reproduction. These vary in age and density. Large areas of this nature belong to lumber companies which had to buy them along with desirable mature timber. It is a question before these companies whether this young forest justifies protection and how long a time. The Edward Rutledge Timber company is especially interested in this problem, and it was due to their request that this project was initiated.

To answer this question it was deemed that a prediction of yields would be necessary. The first real effort to do this was made by the author and an assistant, Mr. Wheaton, in the region of Clarkia, Idaho, during the summer of 1924. A period of five weeks sufficed to cover 55 forties by a strip survey method. The survey was made by forties.

After some experimenting it was found that a method offering reasonable accuracy and speed consisted of running a strip thru the middle of each forty. The strip was one-half chain wide and trees of all species were tallied down to 2 inches D.B.H. In running the strips a standard Forest Service compass was used with a two chain trailer tape for distance.

The survey in each forty really consisted of five sample plots each two chains long and one-half a chain wide, since the trees were tallied only on alternate strentchings of the tape. This was done to speed up the work and, as the "plots" were uniformly spaced, it was felt that a good average of the forty would be obtained. By this method a mile a day, or four forties, could be run.

Besides tallying the reproduction, sample heights of average dominants were taken and borings made to determine the age of the stand. These measurements were made on four or five trees at the end of each five chains of the strip.

In the office, the computation was based on trees 2 inches and up, 7 inches and up, 10 inches and up,—three classes . Table 1 shows a sample forty fully worked out.

Next, each forty was compared with Forest Service normal yield tables for western white pine—those worked out by Larsen and Haig of District One. These yield tables were classified by sites I, II, and III. On the basis of height of dominants for a certain age, each forty was regulated to one of the three sites and the comparison of basal areas gave a reduction factor from the normal yield table to the usually understocked forty. Yields were predicted by ten year periods from 1924 to

**Table I**
**Growth Studies in White Pine Reproduction—Clarkia, Idaho, 1924.**

| Species | Species per cent | Total number of trees 2 inches and up | Average D. B. H. 2 inches and up | Basal area | Trees 7 inches and up | Average D. B. H. 7 inches and up | B. F. volume 7 inches and up | Per cent valume 7 inches and up | No. trees 10 inches and up | Average D. B. H. 10 inches and up | Volume B. F. 10 inches and up | Per cent volume 10 inches and up |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| White pine | 44.0 | 182 | 6.2 | 45.37 | 74 | 9.1 | 2,860 | 48.8 | 18 | 13.1 | 1,410 | 40.4 |
| Larch | 4.0 | 12 | 7.0 | 4.08 | 6 | 10.0 | 330 | 5.5 | 2 | 14.0 | 240 | 7.7 |
| Douglas fir | 16.5 | 66 | 3.4 | 13.94 | 22 | 8.9 | 815 | 13.4 | 8 | 10.7 | 400 | 12.S |
| Lodgepole pine | 16.0 | 64 | 6.7 | 17.93 | 28 | 10.8 | 1,560 | 25.9 | 16 | 12.7 | 1,220 | 39.1 |
| Hemlock | | | | | | | | | | | | |
| White Fir | 16.0 | 64 | 4.8 | 9.62 | 12 | 8.2 | 390 | 6.4 | | | | |
| Red cedar | 2.0 | 8 | 2.2 | .23 | | | | | | | | |
| Engelmann spruce | 0.5 | 2 | 2.0 | .04 | | | | | | | | |
| Yellow pine | 1.0 | 4 | 3.0 | .22 | | | | | | | | |
| Totals and Averages | 100.0 | 402 | 5.5 | 91.43 | 142 | 9.4 | 5,955 | 100 | 44 | 12.6 | 3,270 | 100 |

Acre Basis.
Township 42 N. 2 E.
Section 5.

Forty No. 5.
Aver. Age 32.
Dom. Hgt. 45.

**Table II—Summary of Data Sheets for 48 Forties**

| Age | Hgt. Av. Dominant | Total No. Trees 2 in. D. B. H. and over | Av. D. B. H. Trees 2 in. and up | Basil Area Sq. In. | No. Trees 7 in. D. B. H. and over | Av. D. B. H. Trees 7 in. and up | B. F. Vol. Trees 7 in. and up | No. Trees 10 in. D. B. H. and over | Avr. D. B. H. Trees 10 in. and up | B. F. Vol. of Trees 10 in. and up |
|---|---|---|---|---|---|---|---|---|---|---|
| 33 | 43 | 623 | 4.6 | 86.6 | 109 | 8.5 | 4,017 | 26 | 11.0 | 1,724 |
| | | | | Corresponding Figures from Site III Yield Tables | | | | | | |
| 33 | 44 | 1200+ | | 98.0 | | | | | | 2,000 |

Figures Averaged on Acre Basis for 48 Forties.

1984 or 1994—far enough so that the stand would be 90 to 100 years old.

Table II shows conditions averaged for the whole area covered with the exception of one poor area taken near the summit of the Clearwater-St. Joe divide.

It is evident from Table II that the average of the data would not allow better than a site III yield table for comparison. This was of course true of the majority of the areas, but nine of the forties were placed in site II. Table II shows a basal area comparison of 86.6 divided by 98.0 which equals 88.5 per cent. This percentage is a little too high, since some site II yield tables were used and these have larger basal areas than a site III table. An actual average of yield table basal areas used is 103.8 square inches, so 86.8 divided by 103.8 equals 83.5 per cent of normal stocking.

In almost every case the number of trees was very low as compared with yield tables. On the other hand the volumes were very high and sometimes equaled or exceeded those of the yield table. Altho the number of trees was low, the growth, particularly in diameter, was correspondingly high. Where the white pine predominated the trees were well spaced with more growing space than was needed. They often were quite limby even to the base.

Table III gives the summary of the predicted yields:

**Table III—Summary of Predicted Yields**

| Sec. No. | Present Age | 1924 | | | 1934 | | | 1944 | | | 1954 | | | 1964 | | | 1974 | | | 1984 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Volume | | | Volume | | | Volume | | | Volume | | | Volume | | | Volume | | | Volume | |
| | | Dom. Hgt. | W. P. | Total | Dom. Hgt. | W. P. | Total | Dom. Hgt. | W. P. | Total | Dom. Hgt. | W. P. | Total | Dom. Hgt. | W. P. | Total | Dom. Hgt. | W. P. | Total | Dom. Hgt. | W. P. | Total |
| 1 | 33 | 40 | 0.3 | 1.2 | 53 | 1.0 | 3.1 | 64 | 1.9 | 5.4 | 73 | 2.8 | 8.4 | 81 | 4.1 | 13.1 | 89 | 5.9 | 19.2 | 97 | 7.0 | 21.3 |
| 25 | 39 | 51 | 0.7 | 1.8 | 62 | 1.7 | 4.3 | 72 | 2.9 | 7.2 | 82 | 4.3 | 9.7 | 90 | 5.8 | 14.6 | 97 | 7.1 | 18.4 | 105 | 8.1 | 21.4 |
| 31 | 31 | 39 | 0.2 | 0.8 | 52 | 0.6 | 3.6 | 62 | 1.1 | 4.2 | 72 | 1.6 | 6.8 | 80 | 2.6 | 10.4 | 86 | 3.5 | 14.2 | 95 | 4.1 | 16.9 |
| 29 | 33 | 43 | 0.4 | 2.1 | 58 | 0.8 | 3.8 | 69 | 1.2 | 6.9 | 79 | 2.2 | 12.2 | 87 | 3.3 | 16.1 | 95 | 4.2 | 20.7 | 102 | 5.1 | 25.2 |
| 19 | 32 | 44 | 0.6 | 1.3 | 55 | 1.6 | 3.8 | 65 | 2.7 | 6.5 | 74 | 4.3 | 10.4 | 82 | 6.7 | 15.9 | 90 | 9.0 | 21.8 | 97 | 10.6 | 25.7 |
| 5 | 33 | 44 | 1.7 | 3.0 | 63 | 2.9 | 5.3 | 77 | 6.3 | 11.4 | 92 | 9.5 | 17.6 | 104 | 10.2 | 22.7 | 113 | 16.8 | 31.8 | 120 | 20.6 | 29.0 |
| Avr. | 33 | 43 | 0.6 | 1.7 | 57 | 1.4 | 4.0 | 68 | 2.7 | 6.9 | 79 | 8.1 | 10.9 | 87 | 5.4 | 15.5 | 95 | 7.7 | 21.0 | 103 | 9.3 | 24.9 |

Summary of Predicted Yields

The highest yields per forty were found in Section 5 where the volumes predicted for 1984 run as high as 63,100 board feet of all species and 43,000 board feet of white pine alone.

Thus far the work has shown that most of the young stands are thrifty and well stocked. There is an average of 34 per cent white pine in them as a whole. It is perhaps surprising that the country about Clarkia falls in site III. The allocation to sites is based on the heights of average dominants in the stand, and if the measurements of these heights were very conservative, at least more so than the yield table, it might throw a site II into site III class. This detail of the work offers chances for variation. The author feels that the satisfactory way for overcoming any error here would be to measure these dominant heights in just the way that was used in assembling the data for the yield table selected as a basis for predictions.

It is planned to extend these studies for one more year, and an effort will be made to study the field methods of a party which District one plans to have work up yield table data for white pine. In applying general yield tables

to local conditions, considerable adjustment is necessary and an intimate knowledge of the methods used in making up the table certainly will not come amiss. During the coming summer, a party of three men will be in the field, and probably at least 100 forty acre units will be examined. This added to the 55 already completed should furnish a good basis for general conclusions.

BEN E. BUSH
First State Forester of Idaho

At the organization meeting of the Idaho cooperative board of forestry held at Boise, March 16, 1925, Mr. Ben E. Bush was nominated by the Board as Idaho's first state forester, and the nomination was promptly confirmed by the state board of land commissioners.

Mr. Bush is an alumnus of the University of Idaho, taking his degree in mining engineering, but almost continuously since his graduation in 1903 he has been associated with some phase of the timber business. In more recent years he has been connected with the state land department as land agent in special charge of timber sales, and in this capacity has acquired an unusual knowledge not only of the state's own timber holdings, but of forestry conditions and forestry needs of the state in general.

It was largely thru his influence and that of the state land commissioner, Hon. I. H. Nash, that the state several years ago began practicing forestry on its timber lands, and all state timber sales are now made under provisions calculated to insure continuous timber crops.

Mr. Bush is a practical forester and timberman, has the confidence of foresters and timber operators and his appointment has met with state wide approval.

EMERA W. RENSHAW
Deputy State Forester

Emera W. Renshaw, recently appointed deputy state forester by the state board of land commissioners, is a member of the class of 1925, School of Forestry, University of Idaho. His appointment was made effective May 1.

In addition to his technical training in forestry, Mr. Renshaw has had valuable practical experience in the woods, having been connected with the Forest Service for some time on timber reconnaissance and fire protection.

Mr. Renshaw is a western man, Washington being his native state, tho in later years he has lived in Idaho, his home being at Kamiah. He therefore, knows western conditions, in partciular the forestry needs of Idaho, and is well qualified for the important post to which he has been appointed.

# SECOND ANNUAL BARBECUE A HUGE SUCCESS

H. I. NETTLETON
Instructor in Forestry

Practically every member of the associated foresters, faculty included, is suffering either from rheumatism sore or dislocated shoulders, black eyes, gunshock, blistered feet or indigestion, as a result of the second annual barbecue, held Saturday afternoon at Rowland's Park.

Transported in twelve cars, ranging in size from "duet-lizzies" to a "twelve-homme" truck the fernhoppers deserted their spring-fever infected class rooms for the pine scented coliseum of Mother Nature and for six hectic hours strived to outdo each other in tests of strength, skill, daring and gastronomic capacity. Mental tests were discarded for the day.

First place in the opening field event was annexed by the juniors when Phelps swung a horse-shoe lined glove against "Utah" Allgood's right eye and gave the sophomores' white hope a glimpse of all the stars in the universe.

Cranston, also a junior, gave his classmates the next two events by winning the 50 and 100 yard dashes, aided by the inability of his competitors to keep from falling over each other's feet.

**Baird and Gregory lead Sophomores**

Baird and Gregory, the Damon and Pythias of the sophomore woodsmen, led the second year men to victory in the rifle shoot, although, despite Professor Watson's strict chaperonage, it is rumored that the boys killed one cow and a "crested wicky-bird," which accidentally flew within range of the gold dust twins. The freshmen, nearest competitors in this match, claim that "Spike" Gregory shoved his wooden leg thru the bull's eye of his target before it was erected and then claimed that he had bunched his hits within the black circle.

The next event, a tug-of-war across White Mule Creek, between ten man teams of the underclassmen, resulted in the drowning of the entire sophomore team, which went down to a watery grave without a murmur—due principally to the fact that the sophomores inhaled too much mud to do much talking.

Not satisfied with this wholesale massacre, the rooks next proceeded to take the third year men across the Rubicon to their decisive defeat. When the battle smoke had lifted, the second casualty victim of the day, Ted Seely, was found stretched on the ground with a dislocated shoulder—which proved the pulling power of the first year men.

Senior team winning the log sawing contest

**Space Swings Mean Axe**

Space, senior, gave his classmates first honors in the log chopping contest by driving his axe thru a twelve inch yellow pine log in one minute and forty-five seconds, although his sophomore brother was a close second in this event.

Chagrined by their muddy defeat in the tug-of-war, the juniors came back in the log sawing contest when White and Callender smoked

the six foot crosscut thru a tough old fir so fast that the flying sawdust burst into flames as it left the log, requiring the installation of a home made sprinkling system to avoid a general conflagration.

The sophs had their inning in the wrestling meet when Burroughs threw Downer over McLaughlin's new Essex Coach and then won from Bolles thru forfeiture. In the meanwhile some of the lumberjacks had constructed a temporary dam in White Mule Creek, then coaxed a log into its rapidly rising waters and proceeded to stage an informal log rolling contest. Due to lack of experienced entries, this event degenerated into a mud hen diving contest in which the log invariably remained on top.

Thus ended the field meet in which the class standing was as follows: Juniors first, with 28 points; sophomores second, with 26 points; freshmen third with 19 points and seniors fourth with 11 points.

At 6:15 p. m. Chef Bolles' stentorian invitation to "come and get it" caused a general rush for chow tools and within sixty minutes about forty dollars worth of roast pork, beef, hot-dogs, baked potatoes, and beans, topped off with ice cream, had all disappeared and the second annual barbecue was history.

# THE FORESTERS' EXHIBIT

Clarence C. Olsen, '26.

The Associated Foresters' Exhibit, sponsored and staged by the students of the School of Forestry, as an intregal part of Engineers' Day, was visited by many hundreds of people. In conjunction with the Engineers, Architects, Physicists and Miners, a united exhibit was held at various places of the campus on May 1, 1925. To Harold Z. White and Warren H. Bolles goes the credit for the successful carrying out of the Foresters' share in the exhibit. Thru the assistance rendered by the faculty, and the wholehearted cooperation of the club, the affair went over with even a louder bang than had been expected.

The exhibit was staged in and about the University Hut. On the exterior of the Hut and surrounded by a ring of hastily planted conifers, several forestry practices and object lessons were situated. A model camp, tempting in its allurement, first attracted the eye and gave to the event an atmosphere of rustic comfort. What was the difference even though a prevalence of snowshoes emphasized an equally great absence of snow? Anyone familiar with "Spike" Gregory's sense of humor could easily understand that. Which reminds me ————.

A further element of humor was added by this same Gregory and "Devildog" Hatch's dog—the latter was an animated sandwich-dog, informing the world of our exhibit, and "Spike's" pegleg bore a placard which conveyed the information that it too was made of wood.

But to continue—banked up against the building an erosion experiment, built up to depict the value of forest cover to land surface and to watershed purposes, illustrated the importance of that problem. The designer, Warren Bolles, also acted as barker for the act, and told in glowing terms the usefulness of tree-covered elevations.

It had as a neighborly rival a model forest in charge of Bob McLaughlin, which demonstrated clearly the effect of scientific management in logging operations. A miniature logging railroad and millpond with log decks and cut-over areas aptly told of lumbering practices. A well located lookout station overlooked the surrounding area, thanks to the jackknives of several wood-carving foresters.

Foresters Saling and Spence, sawed much lumber and created many piles of sawdust with the model sawmill loaned thru courtesy of the Higgins Machinery Company of Seattle, Washington. This event attracted especial attention as did the demonstration of the Northern Fire Pump, which was the pampered pet of Johnnie Baird. Outside of drowning a couple of wide-eyed spectators, no other casualties took place during this feature of the show.

Still another event that kept the audience enraptured was the log sawing contest. Mr. E. F. Mitchell, representing the Atkins Saw Company, kindly put on this exhibit, in which several teams were entered. First place was won by Bentz and J. Space. The saw used by them was buckled and partially melted when this event was completed.

"And now, folks, please step aside. We have here," sang out the announcer. What have we? Ah! Look! The whole main room was lined with exhibits, each portraying some particular field of endeavor in forestry. There

was an exhibit of wood preservative devices and materials, beginning with creosoting apparatus, following the initial exhibit of a collection of lumbering tools and appliances used in the field.

Lewis Cummings brought tears to the eyes of his audience as he told of a tree's destruction and the final products emanating from the ruin. Pulpwood, matting, chemicals and what not illustrated the practices of by-product workers.

"Spike" Gregory's fearless lassoing of a galloping charger thrilled the awe stricken onlookers. And when he demonstrated how a diamond hitch should be thrown upon a vicious pack animal, a mighty cheer echoed throughout the hall. After that example of mighty prowess, our patrons were willing for anything to happen.

It did—"Bung" Snow and Bill Guernsey sold them a lot of blister rust propaganda. With jars of examples and a multitude of pictures they harangued a guileless public. They went so far as to illustrate how one sneaks upon an unsuspecting blister and not content with that, they distributed literature to keep the visitors interested after they had departed.

Surrounded by plane tables, scale sticks, hypsometers, and other mensuration equipment, an Osborne fire finder attracted the public gaze. Here Williams and Olsen kept one eye on the bystanders who acted as tho they believed these keepers of the Abney, and the other eye searching the crowd for Prof. Nettleton, who could have spoiled a good thing had he been so inclined.

The photographs of national forest scenic beauties loaned by the Forest Service were exceedingly popular and caused much favorable comment. Likewise the fine collection of forest views and game pictures kindly loaned by Don Fisher, enhanced the attractiveness of the exhibit and brought forth envious glances of approval.

Forest Service signs, typical of forested areas, cast their influence for forest protection, thruout the exhibit and caused the foresters at least to feel at home. It is impossible to tell everything that occurred; a constant stream of spectators witnessed and enjoyed the exhibit.

After the majority of the audience had passed thru, two reels of pictures were shown. One depicted the activities of the blister rust campaign thruout the northwest and the other was of the scenic attractions in the various national forests of Montana.

We cannot but feel that the Exhibit was a huge success and hope that those who saw it enjoyed it as greatly as we desired that they should.

# FORESTERS' ANNUAL BANQUET

Ralph B. Ross, '27

On the evening of March 3, 1925, one hundred and five foresters and guests sat down to the ninth annual banquet of the Associated Foresters. The scene of this event took place in the new Blue Bucket Inn and the men were gathered from the four corners of the globe.

Everything from fruit cocktail to roast pork and hot rolls was set before the hungry foresters and their over-worked nerves were soothed thruout the banquet by the gentle strains of a campus orchestra.

When the last man had leaned back in his chair and sighed, the program for the evening began. Prof. C. W. Watson acted in the capacity of toastmaster, and the witty remarks he used in introducing the various speakers made many of the foresters throw fits of laughter.

The various speakers on the program and their subjects were Rev. H. O. Perry, "An Amateur's Appreciation of Reforestation"; Elers Koch, "The Forest Service in Idaho"; Geo. N. Lamphere, "Forestry and the Business Man"; Ben E. Bush, "The New Idaho Forestry Law"; Dean Ivan C. Crawford, "My Observations of Forestry"; L. F. Parsons, "A Brief History of the Lumber Industry In This Vicinity"; and Kenneth Dean who gave a monologue in which he recounted his experiences when coming west last fall.

At the stroke of ten by Prof. Watson's Ingersoll, the banqueters filed out of the hall with the happy and contented feeling that the ninth annual banquet was the most successful ever given.

# THE FIRST ANNUAL FORESTERS' SMOKER

H. I. NETTLETON
Instructor of Forestry

The first annual smoker of the Associated Foresters was held in the University men's gymnasium on Friday evening, November 21. The program started with an obstacle race with a single entry from each class stripped to his B. V. D.'s and required to gallop from one end of the gym to the other in search of sox, shirt, trousers, and coat, in the order named. Cranston, sophomore, won the event with Snow of the senior class a close second.

Hoffman and Vickrey, underclassmen, tried in vain to wear each other down in the next event, a three round boxing contest refereed by "High Power" Ross and resulting in a draw. After the bloody arena had been sprinkled with clean sand, H. P. Magnuson of the College of Agriculture, tickled the funnybones of the Foresters with his Swedish monologues.

Hatch and Phelps, representing the sophomore and junior classes respectively, then proceeded to sidetrack each other's noses with the leather mittens, but again the referee called a draw match. As a change from the gory spectacle just enacted, Renshaw of the seniors soothed the racing blood of the crowd with several well played selections on his banjo.

The next number was a junior event, in which Lansdon and Williams pushed and punched their way to the third boxing draw of the evening, after which the Gym was suddenly enveloped in Stygian darkness.

When the lights came on again, the crowd was electrified to find a demure dancing maiden, alias "Spike" Gregory, gracefully pirouetting, pivoting, and swinging to the wild, weird notes of the Boston pianist, Ted Seely. "Madame" Gregory's performance left the crowd almost too breathless to cheer the principals in the next event—a wrestling match between Ward and Stahl, in which Ward suffered a broken foot and retired. Then referee Ross called Downer and Greer on the mat for a second wrestling bout in which Downer won with a fall in just 30 seconds.

Erickson, presumably fresh from Sweden's distant shores, then entertained the club with several recitals of his experience upon arrival in America.

The next event was a tumbling stunt featuring "Polly" Lehrbas, "Bud" Bliss, and "Red" Pendergrast. These men put on a clever and well balanced act which well deserved the reception it received.

While cider, pretzels, cake and cookies were being placed for the final act, Heggie and Gregory shook the floor with their clogging shoes and when the "eats" committee invited the eighty odd foresters to "come and get it" they needed no second invitation. Thus ended the first annual Foresters' Smoker.

# XI SIGMA PI

Lewis Cummings, '25.

Xi Sigma Pi was instituted in 1908 on the Campus of the University of Washington, but it was not until 1915 that it became the national honorary forestry fraternity as it exists today. There are now eight active chapters of Xi Sigma Pi extending from coast to coast, while petitions are received each year from the different forestry schools of the country for chapters in their respective schools.

Epsilon Chapter of Xi Sigma Pi was established at the University of Idaho in 1920. The class of '25 can boast of having all its members in this fraternity.

The objects of the fraternity, to secure and maintain a high standard of scholarship in forest education, to work for the upbuilding of the profession of forestry, and to promote fraternal relations among earnest workers engaged in forest activities, have always been uppermost in the selection of new members.

To better further the ideals of high scholarship among the students enrolled in the School of Forestry, Xi Sigma Pi purchased a bronze tablet of beautiful and artistic design, upon which each year the names of the freshman, sophomore, junior, and senior who have attained the highest average in their respective classes are placed. This tablet is

hung in a conspicuous place in the Administration building and is splendidly fulfilling the purpose for which it is intended.

The students whose names are now engraved on the plaque and the years they attained the highest scholastic average of their class are listed as follows:

1922—James W. Farrell, senior; Russel M. Parsons, junior; Arthur M. Sowder, Sophomore; Paul H. Harlan, freshman.

1923—Albert S. Daniels, senior; Ralph S. Space, junior; Paul M. Harlan, sophomore; Floyd W. Godden, freshman.

1924—Rodgers G. Wheaton, senior; Robert P. McLaughlin, junior; Floyd Godden, sophomore; Henry Hoffman, freshman.

To be eligible for membership into Xi Sigma Pi, a student must have completed two and one-half years of standard college work in an approved School of Forestry, three-fourths of his grades shall have been above 80 per cent, and he shall not have received any failures in forestry subjects. He shall also have shown a creditable interest and activity in practical forestry work.

As much weight is placed upon a man's practical ability, such as adaptability to forestry work or lumbering, capacity for leadership, and promise of attainment, as is placed upon his scholastic work. By this means of grouping and by stimulating the desire of the underclassmen for election to the fraternity it is hoped that the objects of the fraternity may continue to be maintained.

The officers for the year 1924-1925 are: Robert P. McLaughlin, Forester; E. W. Renshaw, Associate-Forester; Lewis Cummings, Secretary-Fiscal agent; and Paul M. Harlan, Ranger.

The members of the faculty of Xi Sigma Pi include: Dean F. G. Miller, Dr. Henry Schmitz, Clarence Watson and Harry I. Nettleton.

The new members initiated April 3 are: Des Raj Malhotra, '25; Clarence C. Olsen, '26; Eugene V. Phelps, '26; Mark Lehrbas, '26; W. H. Bolles, '26; and Eugenio de le Cruz, '26.

# LECTURERS SPEAK TO FORESTERS

E. W. Renshaw, '25

Following the plan of the School of Forestry several speakers were obtained each to deliver a series of lectures during the past school year. Mr. L. C. Hurtt, Supervisor of the Nez Perce National Forest, was here during the week of February 23-28 and spoke to the students on Range Management. Besides explaining the problems incident to a grazing forest Mr. Hurtt threw some interesting lights on the possibilities of this phase of forestry as a professoin. Our embryo grazing assistants took a new lease on life after hearing Mr. Hurtt, and decided that they were not as far wrong in their choosing of a college course as some of their logging engineer classmates had tried to lead them to believe.

Mr. Elers Koch of the District Office, U. S. Forest Service, Missoula, Montana, delivered a series of lectures during the week beginning March 2. Mr. Koch took as his topic, Management Plans, and explained fully the plans necessary to put and keep a forest on a sustained yield basis, using as examples the management plans of the Kaniksu, Coeur d'Alene and other national forests. These lectures were delightfully instructive and were highly appreciated by the members of the senior class.

We were fortunate in having with us from March 16-21, Mr. Lyle F. Watts, who spoke on the management of yellow pine. Mr. Watts, who is supervisor of the Idaho National Forest, has had much experience in forests of this type and his lectures plainly showed that he was thoroly familiar with his subject. He is a very easy and interesting talker and we hope we may be privileged to hear him again.

On March 23, 24 and 25, Mr. James C. Evenden, Associate Entomoligist, Bureau of Entomology, U. S. Department of Agriculture, spoke to us relative to the depredations on our western forests caused by insects. Mr. Evenden's stay was all too short to enable him to treat his subject as fully as its importance deserves. Mr. Evenden has the happy faculty of making his talks extremely interesting, and, in the parlance of the classroom, of getting them across.

# WHERE THE BOYS WILL BE THIS SUMMER

RALPH S. SPACE, '25

### Graduating Seniors

Lewis A. Cummings passed the junior forester examination and has accepted an appointment on the Washakie National Forest, Lander, Wyoming.

Paul M. Harlan plans to go into private work and his address at present is 1070 Monadnock, Bldg., San Francisco, Calif.

Des Raj Malhotra will sail about July 1 from Seattle for his home in India where he has an appointment with the Indian Forest Service.

Robert Penfield McLaughlin will be engaged for the summer with Prof. Watson in white pine growth studies near Clarkia, Idaho, and will enter the Yale Forest School this fall for post-graduate work.

Emera W. Renshaw has received an appointment as deputy forester for the state of Idaho and will have his office in Moscow, Idaho.

Elva A. Snow passed the junior forester examination and is in receipt of an appointment as junior forester on the Medicine Bow National Forest, Wyoming. His address is U. S. Forest Service, Laramie, Wyoming.

Arthur M. Sowder will be engaged in forestry work in northern Idaho and can be reached thru his home address, 424 Garden Avenue, Coeur d'Alene, Idaho.

Ralph S. Space passed the junior forester examination and has received an appointment on the Blackfeet National Forest, with headquarters at Kalispell, Montana.

### Juniors

Warren H. Bolles will be employed on the Payette National Forest in timber reconnaissance.

William E. Buckingham will continue his work as forest ranger on the Clearwater National Forest at Musselshell Ranger Station, Weippe, Idaho.

William C. Callender, whose home address is 1606 N. 12th St., Boise, Idaho, will spend the summer working in logging camps on the coast.

Eugenio de la Cruz will spend the summer in Alaska.

Ivan S. Doyle will be in Moscow for the summer to attend the summer session of the University.

Walter D. Field will attend the R. O. T. C. camp at Camp Lewis, Wash., and then work at Coeur d'Alene, Idaho, in a sawmill.

Charles E. Fox will be employed on the Selway National Forest in timber reconnaissance work. His address will be Lowell, Idaho.

Orin S. Gudmunsen has accepted employment for the summer at the Great Basin Experiment Station, Ephraim, Utah.

William G. Guernsey will be employed in blister rust reconnaissance work with headquarters at 618 Realty Bldg., Spokane, Wash.

Clifford Hunter expects to resume his work on the Coeur d'Alene National Forest, Coeur d'Alene, Idaho.

Collis Huntington will be on the Nez Perce National Forest out of Grangeville, Idaho.

Prino Icarangal will register in the University of Idaho summer school.

Richard Johnson plans on attending the summer session of the University.

William H. Lansdon has accepted employment with the Potlatch Lumber Co., at Elk River, Idaho.

Mark A. Lehrbas is returning home to Pocatello where he has accepted employment for the summer.

Clarence C. Olsen has received a summer appointment in grazing work and his address will be c/o the U. S. Forest Service, Forsyth, Montana.

Eugene Phelps will be with Prof. Watson making studies of the growth of white pine. His address will be Clarkia, Idaho.

Lawrence Pugh plans to be with the Hopkins Bros. Timber Co., as clerk and check scaler with headquarters at Enaville, Idaho.

Ralph B. Ross tells us he is to work as a smokechaser on the Selway National Forest, Kooskia, Idaho.

Valentin Sajor will attend summer school of the University.

Arlie Toole has accepted work as trail foreman under William E. Buckingham for the summer. His address will be Weippe, Idaho.

Fairly Walrath will be employed on the Clearwater National Forest with headquarters at Crofino, Idaho.

Harold Z. White will be with Prof. Nettleton this summer making studies on increased growth of white pine after logging. Mail addressed c/o the School of Forestry will reach him.

Guy Williams will be engaged in fire protection work on the Clearwater National Forest, Orofino, Idaho.

**Sophomores**

Fred R. Allen will spend the summer on the Snoqualmie National Forest in Washington, and his address is Lester, Washington.

Elmo Allgood expects to work in the forests in Utah but says mail addressed to him at 243 West Sixth No. Street, Salt Lake City, Utah. will reach him.

Lester Bai will work for the Utah Ice and Storage Company, Salt Lake City, Utah, and his address is 923 Princeton Avenue, Salt Lake City.

John C. Baird has accepted employment in forest protection work for the Edward Rutledge Timber Co., Clarkia, Idaho.

Wilfred Beals will be employed for the summer as lookout on the Chelan National Forest, Okanogan, Wash.

Carey Bennett plans to resume his duties with the U. S. Forest Service.

Isaac Burroughs will be engaged in forest protection work for the Edward Rutledge Timber Co., Clarkia, Idaho.

William V. Cranston will work as smokechaser for the Selway National Forest, Kooskia, Idaho.

Virgil Crawford will be employed on the Selway National Forest, Kooskia, Idaho, on trail work.

Francis Gordon Ellis expects to spend the summer working on the Selway National Forest, Kooskia, Idaho.

Melvin Fuller will be located with the Clearwater Timber Co. doing protection work with his address at Orofino, Idaho.

Edwin G. Greene will work as smokechaser on the Clearwater National Forest, Orofino, Idaho.

Chas. A. Gregory will be with the Edward Rutledge Timber Company, Clarkia, Idaho.

Carl Gustafson has accepted employment on the Nez Perce National Forest, with headquarters at Grangeville, Idaho.

Alden Hatch is returning to the Idaho National Forest for the summer. His address will be c/o U. S. Forest Service, New Meadows, Idaho.

Tracy Heggie tells us he will be with the U. S. Forest Service again this summer.

Henry Hoffman gave us his summer address as c/o Musselshell Ranger Station, Weippe, Idaho. He will work for the Forest Service.

Royal H. Johnston will be crew foreman for the Blister Rust Control work, Coolin, Idaho.

Earl Moulton will attend summer military camp at Camp Lewis, Washington.

Galen W. Pike will be employed in Ribes eradication work, White Pine Blister Rust control, Coolin, Idaho.

Oral O. Ross is returing for the summer to his home in Long Beach, Cal., 2225 Perkins Avenue.

Wallace M. Saling has accepted employment as trail crew foreman on the Clearwater National Forest. His summer address will be Musselshell Ranger Station, Weippe, Idaho.

Jackson S. Space will work for the Clearwater Timber Co., as lookout near Orofino, Idaho.

Liter E. Spence will resume his work as commissary clerk, Clearwater National Forest, Superior, Montana.

**Freshmen**

Wm. L. Anderson will be employed on the Selway National Forest in trail work out of Kooskia, Idaho.

Raymond Baldwin plans to spend the summer at his home in Twin Falls, Idaho.

Charles Bentz will work on the Nez Perce National Forest as lookout. His summer address will be Grangeville, Idaho.

J. Bernal Biker will be engaged in timber cruising for the British Columbia Forest Branch, Nelson, B. C., Canada.

Irvin Campbell will be on trail work on the St. Joe National Forest with headquarters at Avery, Idaho.

Chas. Connaughton expects to spend the summer working in the woods.

Victor M. Craig informs us that he will be employed as timekeeper on the St. Joe National Forest, Avery, Idaho.

Kenneth Dean will be engaged in timber survey work in the Adirondack Mountains, New York. His home is Dresden, New York.

Ernest R. Downer will work on the St. Joe National Forest doing trail work. His address will be c/o U. S. Forest Service, St. Maries, Idaho.

Henry Fischer will be employed by the Blister Rust Control Office at Priest River, Idaho.

Gordon Flack is going on the Selway National Forest, Kooskia, Idaho, for the summer to work on trail construction.

Levi M. Frost will work on the Nez Perce National Forest out of Grangeville, Idaho.

George Garmo will be employed by the Loughboro Cedar Co. in shingle manufacture with his address as Greys Creek, Canada.

Harlin Gillett will be with the boys doing trail work on the St. Joe National Forest out of Avery, Idaho.

Vincent Hasfurther states he will work for his parents near Genesee, Idaho.

Irvin Haut will be kept busy on the St. Joe National Forest with trail work and his address will be Avery, Idaho.

Neil Hedrick can be reached at Willapa, Wash., where he will work for his father.

Hugh H. Hughes will spend the summer in Los Angeles, Calif., assisting his father in the carpenter trade.

Floyd McKim will be engaged in trail work for the Selway National Forest, Kooskia, Idaho.

William Mitchell will be employed as ticket agent for the Wilmington Steamboat Co., Wilmington, Del.

Milford Page is going with Prof. Nettleton this summer to make studies on increased growth of white pine after logging. His address will be c/o School of Forestry.

Charles Rector says he has accepted employment on the Nez Perce National Forest doing trail work and his address is Grangeville, Idaho.

Darrel P. Rigney will be engaged in farming at Jerome, Idaho.

Jesse W. Rigney will be employed in Blister Rust Control work at the summer camp, Priest River, Idaho.

Theodore A. Seely will spend the summer as smokechaser for the Selway National Forest, Kooskia, Idaho, under Ranger Ralph Hand.

Earle Stahl is working at Rigby, Idaho.

Charles Stroud will work this summer at trail work on the Nez Perce National Forest, Grangeville, Idaho.

A. Byrd Sumsion expects to be busy with grazing reconnaissance on the Fish Lake National Forest, Chester, Utah.

Robert Ward will work on the Clearwater National Forest doing trail work. His address is Orofino, Idaho.

Rex Wendle will spend the summer working for the Humbird Lumber Co., in the sawmill at Sandpoint, Idaho.

Floyd Williams will be near Coolin, Idaho, employed by the Office of White Pine Blister Rust Control.

# AMONG THE EDITORS

### THE ASSOCIATED FORESTERS

The Associated Foresters, under the able leadership of its officers for the past year, have enjoyed one of the most successful years of its organization. President Buckingham, because of his duties as a ranger in the Clearwater Forest, could be with us only during the first semester but he established a program for the year that was well carried out by the other members of the staff, Clarence C. Olsen, vice-president, and Robert P. McLaughlin, secretary-treasurer.

Many meetings were held thruout the year and the group, which was very cosmopolitan in character, showed a decided interest in the work of the organization. The roster this year carried a total of 127 foresters and this included men from twenty-four states, the Philippine Islands, Canada and India.

At one of the early meetings of the year Dean F. G. Miller, gave a very interesting talk on the conference held by Forest Service men and forest school heads in Washington, D. C. Many of the other meetings were called for the purpose of hearing the special lecturers, their talks being mentioned elsewhere in this publication.

The club went on record as hereafter supporting the several important functions as follows: Dance in the early fall, smoker in the winter, followed by the banquet given after the beginning of the second semester and the barbecue just before school closes in the spring. These events, with the regular business meetings, call for a very full schedule. It is planned next year to have a regular place for gathering for the meetings and the officers for next year have already started work on the establishment of a forestry museum. The Foresters selected to head the organization next year are Clarence C. Olsen, president; Harold Z. White, vice-president; and Warren H. Bolles, secretary-treasurer.

## FORESTERS ANNUAL DANCE

The Associated Foresters of the University of Idaho have earned the reputation of holding one of the outstanding all-college dances of the year and this year was no exception to that honor. Due to a football game held in Spokane the same day as our dance, October 4th, 1925, and several other campus dances the same evening, the crowd was not as large as in former years but to say the dance was a success would be putting it mildly.

The University gymnasium was literally transformed into a coniferous forest, and around the edges of the floor were placed neatly arranged campfires, camping equipment, fire fighting material, etc. Numerous placards scattered about the trees informed the dancers the importance of saving and protecting our forests. The punch booth was set up at one end of the floor and the two forester attendants were kept continually on the go to satisfy the dancers with delicious liquid refreshments. Streamers of branches and boughs formed a closed canopy over the dancers' heads and the orchestra, screened off with trees, supplied the necessary music for the 130 odd couples.

The program was perhaps the most elaborate ever made up by the foresters. The first page inside the cover contained a poem by Joyce Kilmer and each dance carried a line of a poem composed by Mrs. Robert P. McLaughlin. The patrons and patronesses for the affair were Mr. and Mrs. Alfred H. Upham, Miss Permeal J. French, Mr. and Mrs. Francis G. Miller, Mr. and Mrs. Henry Schmitz, Mr. and Mrs. Clarence Watson, and Mr. and Mrs. Harry I. Nettleton.

## ASSOCIATED FORESTERS STAGE ESSAY CONTEST

To stimulate interest among the high schools of Idaho in American Forest Week, the Associated Foresters, this year, put on an essay contest, offering $30.00 in prizes to the three students writing the best essays on the subject: "Why Idaho Should Perpetuate Her Forests." This contest was open to all students under 18 years of age, regularly enrolled in the high schools of the state the past year.

Nearly twelve hundred students from various sections of the state entered the contest and according to letters received from high school principals and students much enthusiasm was aroused in the importance of our great forest resources, not only on the part of the participants, but their teachers and parents as well. So successful was the undertaking that the Idaho Associated Foresters plan to sponsor such a contest each year as a part of their contribution to the observance of American Forest week.

The judges and prize awarding committee consisted of Clarence C. Olsen, President, Idaho Associated Foresters; F. G. Miller, Dean, School of Forestry, University of Idaho; and James Boone, Assistant State Attorney General, Boise, Idaho. Dr. Henry Schmitz, Professor of Forest Products, School of Forestry, University of Idaho, acted as referee.

Following are the winning contestants:

First prize, $15.00, Margaret Warnke, Boise.

Second Prize, $10.00, Dorothy Robel, Sandpoint.

Third prize, $5.00, Glenn Wright, Gannett.

First honorable mention, Florence Auxier, Meridian.

Second honorable mention, Bess Faraday, Mountain Home.

Third honorable mention, Ruth Blackburn, Cottonwood.

## AMERICAN FOREST WEEK

Reports received from all parts of the state would indicate that American Forest Week, April 27 to May 3, was very generally observed. Through the courtesy of Miss Elizabeth Russum, state superintendent of public instruction, Arbor Day exercises in the public schools were combined with those for the celebration of American Forest Week, and this plan made it possible to carry out the purposes of both much more effectively.

The Idaho state committee consisted of F. G. Miller, dean, school of forestry, chairman; W. D. Humiston, assistant general manager of the Potlatch Lumber Company, Potlatch; C. A. Barton, general manager of the Boise-Payette Lumber Company, Boise; Ben E. Bush, state forester, Moscow; C. K. McHarg, Jr., supervisor, Coeur d'Alene National Forest, Coeur d'Alene; T. L. Greer, land agent, Humbird Lumber Company, Sandpoint; and Guy B. Mains, supervisor of the Boise National Forest, Boise. In planning the campaign for the observance of the week, the general committee held two meetings—one at Spokane, and the other at Boise. Valuable assistance was given the committee by Theodore Shoemaker and F. S. Baker, both of the U. S. Forest Service; also R. H. Chapler, Western Forestry and Conservation Association, Portland, Oregon,

and Roy R. Myers, Secretary, Spokane Hoo Hoo Club, each of whom sat in with the committee in one or other of its sessions.

Sub-committees consisted of the school program committee with Dr. Henry Schmitz, professor of forest products, acting as chairman; speakers' bureau, C. W. Watson, assistant professor of silviculture, chairman; press committee, C. K. McHarg, Jr., chairman; and advertising committee, A. D. Decker, land agent, Potlatch Lumber Company, chairman.

The school program committee prepared an attractive program of sixteen pages, which carried well selected material for the use of the public schools in celebrating American Forest Week and Arbor Day. An effort was made to put one of these programs in the hands of every public school teacher in the state. Much credit is due the county superintendents for their hearty cooperation with the committee in the task of assisting the public school in putting on these programs.

The speakers' bureau organized an extensive speaking campaign in which it was sought to send speakers to the public schools and the various business and social clubs thruout the state. Reports are not all in at this writing, but it is known the efforts of this committee were very successful. A greater use was made of the radio than in former years. Mr. Theodore Shoemaker of the Forest Service was the general assembly speaker at the University this year, and also addressed the Moscow Chamber of Commerce.

Mr. McHarg for the press committee reports: "The cooperation of the newspapers was very gratifying, all seemed willing to do everything possible to place before their readers the meaning and importance of the week." Mr. McHarg roughly estimates that the space devoted by the press to news items pertaining to American Forest Week was not less than one hundred and fifty column inches per county in the timbered counties of the state.

Donald H. Yates of the Potlatch Lumber Company reporting for the committee on advertising, states that about ten per cent of the merchants in many of the towns responded to an appeal from the committee to run appropriate slogans with their newspaper ads. In a number of places the merchants put on window displays showing the value and uses of the forest. For example, the forestry committee of the Coeur d'Alene Chamber of Commerce inaugurated a window display contest and secured $100 in cash prizes for the displays exhibiting the greatest attractiveness and most educational value. This is an idea that has splendid possibilities and one that should be more widely used.

Besides the problem of fire prevention, the keynote appeal this year was the necessity of a sustained yield of timber if the industries dependent upon a wood supply are to survive, and if the movement to bring new wood-working establishements to Idaho is to succeed. Everywhere in the state there is a growing interest in the state's forest resources, and the importance of perpetuating them.

## SCHOOL GETS ENLARGED QUARTERS

Alumni and former students recalling the crowded conditions under which the School of Forestry has been working in the past will be interested to know that the removal of the departments of bacteriology and agricultural chemistry from Morrill Hall to the new Science Hall on its completion this summer will make it possible for the School to expand its present quarters in Morrill Hall to include all of the third and fourth floors, the two floors consisting of sixteen rooms.

On the third floor, one large room will be fitted up as a laboratory for dendrology and wood technology, seating thirty-two students, and a second room as a laboratory for silviculture and range management, also with accommodations for thirty-two students. Another room will be used as a laboratory in wood preservation and timber physics, and a fourth room as a research laboratory for advanced students. The largest room on this floor will be used for large classes and for an assembly room. This room will accommodate over one hundred students. There will also be one smaller class room, while another will be used as a combined small class room, and a general utility room for conferences, committee meetings, etc. Just off from this will be the library and reading room. The offices of the dean, professor of forest products, and of the secretary of the School will also be found on this floor.

The fourth floor will contain one large laboratory for the work in mensuration and logging engineering, one sizable class room, an instrument and storage room, and two offices. The laboratories will each be equipped with up-to-date fixtures especially designed for the particular kind of work in hand. Everything will be in readiness when the University opens in September.

# PERSONALS

Word is just received that John H. Zuver, Jr.; Ex-'25, was married to Miss Jessie Mae Wright, June 1. Mr. Zuver is working on a newspaper and gives his home address as 710 Rex Street, South Bend, Indiana.

Stanley Foss Bartlett, (R. C.) '21-'22, has his headquarters at Locke's Mills, Maine, but is still doing art work in that part of the country for newspapers. He recently published a booklet containing poems from his pen. He is known in his country as "The Poet of the Hills".

Kester Flock writes from Pierce City, Idaho, that he is stationed at the Bungalow Ranger Station and expects to be located on Elk Mountain for the summer.

Mr. C. Edward Behre, formerly professor of lumbering of our school of Forestry and now with the U. S. Forest Service at the Northeastern Forest Experiment Station, Amherst, Mass., reported another addition to his family early last fall. This time it was a fine daughter.

Edward T. Nero, '23, was married last winter to Miss Murice McCabe, Plummer, Idaho. Mr. Nero is a ranger on the Clearwater National Forest with headquarters at Orofino.

Frank A. Brown, '22, announced his marriage last fall to Miss Pearl Stalker, '24. California is their state now and their address is 3218 South Hoover St., Los Angeles.

Henry L. Smith, '12-'14, is connected with the U. S. Forest Service at McCall, Idaho, employed as principal clerk. Mr. Smith paid the School of Forestry a visit last winter. He expressed considerable surprise upon the many campus changes that have taken place since his last visit here.

Gail Chamberlain, 'ex-'22, was married last Christmas to Miss Jean Richards of Spokane. Mr. Chamberlain reports his home address as Bend, Oregon, where he is employed by the Brooks-Scanlon Lumber Company.

Jack W. Rodner has been able to pay Moscow several visits thruout the past year. He is connected with the Coeur d'Alene Timber Protective Association doing work along the line of blister rust control.

Fred Chamberlain, Ex-'23, announced his marriage to Miss Edith Dingle, '23, Coeur d'Alene, Idaho, early this spring. They are living at Lynn, Mass., where Mr. Chamberlain is employed as sales manager of the Brockway-Smith Corporation of Boston, Mass.

William H. Godson, who was registered in school last year writes from Lacolle, P. Q., Canada, that he is now resident engineer for the Napierville Junction Railway Company.

Floyd W. Godden, Ex-'27, on his way from Wisconsin to Weippe, Idaho, spent a day or two in Moscow the first week in June. Mr. Godden will spend the summer as commissary clerk at the Musselshell Ranger Station, located near Weippe, Idaho. He will again register in the School of Forestry in September.

J. Warren Stoneman, Ex-'24, writes us that he is now the proud father of a daughter born February 24. He is living with his family near Hillyard, Washington, Route No. 9.

Albert S. Daniels, '23, was married to Miss Margaret M. Macey about a year ago. This is the culmination of a romance started while both were in attendance here at the University. Mr. Daniels last gave us his address as Houston, Texas, where he was connected with the National Lumber and Creosoting Company as assistant superintendent.

Theodore A. Seely, who was registered in school this year was married last summer to Miss Charlotte Crandall. The couple are living in Moscow.

The many friends of Orlin Dean D'Atley, Ex-'27, who was registered in school last year, were grieved to learn of his sudden death last December 31, in Lewiston, Idaho. His death was due to a combination of diseases caused by an attack of influenza.

Norman F. Gillham, Ex-'26, writing from Box 1041, Flagstaff, Arizona, says he is at present employed in a sawmill. He was obliged to drop out about the middle of the first semester and says he will be back next September to complete his work for the degree.

Rodgers G. Wheaton, '24, who spent the past year at Yale Forest School working for his master's degree, arrived at Moscow, June 5, to spend a few days visiting. He will be located in District 1, with headquarters at Livingston, Montana.

William E. Buckingham, Ex-'26, at the close of the first semester was called to his post as ranger of the Musselshell Ranger District Weippe, Idaho.

Chester W. Hills, Ex-'27, writes from Camp No. 7, Big Creek, California, that he is getting

a lot of experience in railroad construction and logging and that he plans to be back in school this fall.

Richard L. Kemp, Ex-'28, tells us that he is working in a sawmill at Spirit Lake, Idaho, his own home town, and will be among those present next fall when school starts.

William Byron Miller, '22, who spent the past year at the University of California taking graduate work in range management, is now located in Alaska where he will be with the U. S. Biological Survey, with headquarters at Fairbanks, Alaska. It has been reported to us that Byron is now a married man, but this is unconfirmed as we go to press.

Edwin C. Rettig, '19, logging engineer for the Clearwater Timber Co., Orofino, Idaho, surprised us recently by engaging in wedlock. His wife was formerly Miss Esther Pearson of Sandpoint, Idaho, and a graduate of the University of Idaho. We understand that's where the romance started.

# ROSTER OF STUDENTS

The following is a list of students in actual attendance at the School of Forestry during the year 1924-1925. The information after each name is in the following order: 1, name; 2, home address; 3, social fraternity; 4, honorary fraternity; 5, scholastic, athletic and campus activities.

### Seniors

Cummings, Lewis A.; St. Petersburg, Florida; Xi Sigma Pi.

Gillham, Norman F.; Edwardsville, Illinois; Alpha Tau Omega.

Harlan, Paul M.; Jackson, Tenn.; Kappa Sigma; Alpha Zeta, Xi Sigma Pi; Associate Editor "Gem of the Mountains" '23-'24, Editor '24-'25, Winged Helmet, Silver Lance, Ball and Chain, Glee Club '23-'24.

Malhotra, Des Raj; Jammu, Kashmire State, Punjab, India; Xi Sigma Pi.

McLaughlin, Robert P.; Idaho Falls, Idaho; Acacia; Xi Sigma Pi; Secretary-Treasurer Associated Foresters '24-'25.

Renshaw, Emera W.; Kamiah, Idaho; Phi Gamma Delta; Xi Sigma Pi; Alpha Zeta; Pep Band, Vice President Associated Foresters '23-'24.

Snow, Elva A.; Boise, Idaho; Kappa Sigma; Xi Sigma Pi; Alpha Zeta; Baseball "I" '22, '23, '24.

Sowder, Arthur M.; Coeur d'Alene, Idaho; Sigma Alpha Epsilon; Sigma Xi; Xi Sigma Pi; Alpha Zeta; President Associated Foresters '22-'23. Secretary-Treasurer '23-'24, Editor "Idaho Forester" '24-'25, Silver Lance, English Club, Track "I" '23, '24, '25, Cross Country "I" '24, '25.

Space, Ralph S.; Weippe, Idaho; Xi Sigma Pi; Associate Editor "Idaho Forester" '24-'25. High honors.

### Juniors

Bolles, Warren H.; Little Valley, New York; Xi Sigma Pi.

Buckingham, William E.; Gifford, Idaho; Xi Sigma Pi; President Associated Foresters '24-'25.

Callender, William C.; 1606 N. 12th St., Boise, Idaho.

Cruz, Eugenio de la; Lingayen, Pang, Philippine Islands; Xi Sigma Pi.

Doyle, Ivan S.; Moscow, Idaho.

Field, Walter D.; Huston, Idaho; Phi Delta Theta; Baseball "I" '24, '25.

Fox, Charles E.; Utica, New York; Alpha Tau Omega; Joke Editor "Gem of the Mountains" '24-'25.

Gudmunsen, Orin S.; Moscow, Idaho; Sigma Chi; Assistant Business Manager "Idaho Forester" '24-'25.

Guernsey, William G.; Poughkeepsie, N. Y.; Phi Delta Theta; Assistant Business Manager "Idaho Forester" '23-'24.

Hunter, Clifford H.; Coeur d'Alene, Idaho; Phi Delta Theta.

Huntington, Collis H.; Batavia, New York.

Icarangal, Primo E.; Pangil Lag., Philippine Islands.

Lansdon, William H.; Boise, Idaho; Phi Delta Theta; Baseball "I" '24, '25.

Lehrbas, Mark; Pocatello, Idaho; Kappa Sigma; Xi Sigma Pi; Baseball "I" '25.

Olsen, Clarence C.; Seattle, Wash.; Sigma Alpha Epsilon; Xi Sigma Pi; Associate Editor "Idaho Forester" '23-'24, Vice-President Associated Foresters '24-'25, President Sophomore Class '23-'24, English Club, Curtain, Silver Lance, Manager of Dramatics.

Phelps, Eugene V.; Barrington, Illinois; Alpha Tau Omega; Xi Sigma Pi.

Pugh, Lawrence; Springston, Idaho.

Ross, Ralph B.; Gary, Indiana; Alpha Tau Omega; Wrestling "I" '25.

Sajor, Valentin; Cafugas, Ilosos Sur; Philippine Islands.

Toole, Arlie W.; Marshfield, Oregon; Business Manager "Idaho Forester" '24-'25.

Walrath, Fairly J.; Orofino, Idaho; Phi Gamma Delta; Pep Band.

White, Harold Z.; Moscow, Idaho; Xi Sigma Pi.

Williams, Guy V.; Boise, Idaho; Sigma Nu.

### Sophomores

Allen, Fred R.; Lester, Washington; Sigma Alpha Epsilon; Glee Club '24-'25.

Allgood, Elmo; Salt Lake City, Utah.

Bai, Lester; Salt Lake City, Utah.

Baird, John Cecil; Chicago, Illinois; Sigma Alpha Epsilon; Rifle team.

Beals, Wilfred F.; Okanogan, Wash.

Bennett, Carey H.; Ogden, Utah.

Burroughs, Isaac C.; Poughkeepsie, N. Y.; Delta Chi; Associate Editor "Idaho Forester" '24-'25; Ball and Chain.

Cranston, William V.; Mt. Vernon, Wash.

Crawford, Virgil O.; Opportunity, Wash.

Ellis, Francis G.; Idaho Falls, Idaho.

Fuller, Melvin F.; Orofino, Idaho; Phi Gamma Delta; Pep Band.

Greene, Edwin G.; Moscow, Idaho.

Gregory, Chas. A.; Chicago, Ill.; Sigma Alpha Epsilon; Frosh Football '24-'25; Rifle team.

Gustafson, Carl A.; Vancouver, Wash.

Hatch, Alden B.; Bryn Mawr, Pa.

Heggie, Tracy L.; Montpelier, Idaho.

Hoffman, Henry C.; Galesburg, Ill.

Johnston, Royal H.; Everett, Mass.

Jones, Merlin V.; Firth, Idaho.

Moulton, Earl R.; Lynn, Mass.; Alpha Tau Omega.

Pike, Galen W.; Woodstock, Conn.

Ross, Oral O.; Long Beach, Cal.

Saling, Wallace M.; Weippe, Idaho.

Space, Jackson W.; Weippe, Idaho.

Spence, Liter E.; Park Ridge, Ill.

### Freshmen

Allen, Dale T. ;Cottonwood Falls, Kansas.

Anderson, William L.; Malad, Idaho.

Baldwin, Raymond F.; Twin Falls, Idaho; Alpha Tau Omega.

Bentz, Charles E.; White Bird, Idaho.

Biker, J. Bernal; Nelson, B. C.; Sigma Chi.

Bloom, Lawrence C.; Wallace, Idaho.

Campbell, Irvin A.; Portland, Oregon; Sigma Alpha Epsilon.

Clark, Benton; Moscow, Idaho.

Connaughton, Charles A.; Placerville, Idaho.

Craig, Victor M.; Avery, Idaho; Alpha Tau Omega.

Dean, Kenneth F.; Dresden, N. Y.; Sigma Alpha Epsilon; Frosh Football '24-'25.

DeHaas, Hubert; Cascade, Idaho.

Downer, Ernest R.; Sioux City, Iowa.

Fischer, Henry A.; Mt. Vernon, New York.

Flack, Gordon L.; Spokane, Wash.

Frost, L. Milward; Salina, Kansas.

Fullerton, Claude R.; Duncan, Arizona.

Garmo, George A.; Bellingham, Wash.

Gillett, Harlin W.; King Hill, Idaho.

Greer, Harold P.; King Hill, Idaho.

Hasfurther, Vincent J.; Genesee, Idaho.

Hahn, Fred P.; Spokane, Wash.

Haut, Irvin; Mitchell, South Dakota.

Hedrick, Neil W.; Willapa, Washington.

Hughes, Hugh H.; Los Angeles, Cal.; Phi Delta Theta; Frosh Football.

Jensen, Alfred E.; Caldwell, Idaho.

Johnson, Wilfred; Lowell, Wash.

Kauffman, Alton T.; Orofino, Idaho.

Kieswetter, Oscar M.; Houston, Texas.

Lee, Harold E.; Medford, Mass.; Delta Chi.

McKim, Floyd A.; Lansing, Mich.

Mitchell, William W.; Wilmington, Delaware.

Page, Milford M.; Union Springs, N. Y.

Rector, Charles M.; Bryan, Ohio.

Richardson, John L.; W. Newton, Mass.

Rigney, Darrel P.; Jerome, Idaho.

Rigney, Jesse W.; Jerome, Idaho.

Seely, Theo. A.; Belfast, New York.

Stahl, Earle; Rigby, Idaho.

Stroud, Charles C.; Natchitockes, La.

Sumsion, Byrd; Chester, Utah.

Vickrey, Dwight R.; Firth, Idaho.

Walker, Raymond E.; Ashton, Idaho.

Ward, Robert D.; Bryan, Ohio.

Wendle, Rex; Sandpoint, Idaho; Sigma Nu; Frosh Football, Basketball.

Wiks, David L.; Coeur d'Alene, Idaho.

Williams, Floyd E.; Rosalia, Wash.

### Rangers

Beauregard, Clayton; Fillmore, Utah.

Bergman, Harold E.; Bark River, Mich.

Case, George W.; Kooskia, Idaho.

Chambers, Howard J.; Baker, Oregon.

Coleman, William W.; Cascade, Idaho.

Collins, Arthur E.; Vancouver, B.C.

Dawson, Robert B.; Cranbrook, B. C.

Hume, John F.; Nelson, B. C.

Hupe, Andrew M.; Spokane, Wash.

Noyes, Sherman A.; Donard, Wash.
Roat, Celeste A.; Red Lodge, Mont.
Smith, William H.; Tygh Valley, Oregon.
St. Mar, Albert W.; Spokane, Wash.
Tucker, Gerald J.; Elgin, Oregon.
Weinemann, Attlee; Orofino, Idaho.
Wells, Harold E.; Manitoba, Canada.
Whitaker, Clarence; Elba, Idaho.
Whitaker, Frank S.; Elba, Idaho.
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## WHY A STATE CONSERVATION POLICY IN IDAHO?

(Continued from page 4)

we reserve everything from 14 inches in diameter down to the smallest seedling. A green cover is left which reduces the fire hazard to a minimum and gives us the advantage of years and years of growth of timber, which under the method pursued up to that time would have been destroyed, leaving the land a black, desolate, barren waste. Under this method, nature will do the reforestation. No planting of trees with its enormous cost and loss of time will be necessary.

Many who have followed the old method of waste and destruction still contend that this slashing disposal requirement cannot be profitably met. Our answer is—we have enforced these requirements in all our sales for the past six years, and our stumpage is still in demand at a higher price each succeeding year. The same holds true with sales made by the U. S. Forest Service, which makes similar requirements.

There is no department of our State Government in which the entire people should take a deeper and more vital interest than in its State-owned land and timber. No selfish interests or false economists should be permitted to endanger the welfare of the State or waste its resources. We should use every legitimate means of protecting the magnificent gift bestowed upon the people of Idaho by a generous Nation.

## POSSIBILITIES OF PULP AND PAPER INDUSTRY IN NORTH IDAHO

(Continued from page 6)

The Coeur d'Alene and St. Joe National Forests are both tributary to Coeur d'Alene Lake, both by rail shipments and by drivable streams flowing into the lake. The St. Joe Forest contains some excellent bodies of spruce, aggregating about 295 million feet, and a little over 100 million of white fir and hemlock. The Coeur d'Alene is estimated to carry forty million of spruce, 160 million of hemlock, and 480 million of white fir. The estimate on hemlock is probably low.

The Sandpoint region, including Bonner and Boundary Counties, is being more rapidly depleted of its privately owned timber than any other section of the State. A pulp mill in this section for a permanent supply would have to depend very largely on National Forest and State timber, although there would probably always be a considerable cut of second growth white fir and hemlock coming in from private lands after the virgin timber is exhausted, and Canadian spruce would be an important supply. The Kaniksu and Pend Oreille Forests, and perhaps the Kootenai Forest in Montana, might be considered tributary to this region. The Kaniksu Forest is estimated to carry eighty million feet of spruce, 180 million hemlock, and 140 million white fir, the Pend Oreille 200 million spruce, eighty million hemlock, and 125 million white fir, the Kootenai 760 million spruce, eighty-five million hemlock, and eighty-five million white fir, making a grand total of 1,040 million spruce, 345 million hemlock, and 350 million white fir. The amount of hemlock which would be eventually available is probably far greater than this, since there are vast bodies of very old stands of partially defective hemlock which have been given little weight in the estimates, and from which eventually large amounts could be culled for pulp wood. Both the Kootenai and Pend Oreille Forests bear some heavy stands of spruce, though the spruce type is usually located in the basins at the heads of streams, and consequently does not offer cheap logging.

Considering only the matter of a permanent supply of timber, there seems little doubt that North Idaho could maintain several paper mills. Under present conditions pulp wood could be obtained considerably cheaper than in most of the established paper manufacturing regions of the East. Department of

Agriculture Bulletin No. 1241 gives the average pulp wood prices in the United States, f. o. b. mill per cord, as follows:

| | |
|---|---|
| 1922 | $16.20 |
| 1921 | 20.10 |
| 1920 | 15.95 |
| 1919 | 13.93 |

During the same period, in North Idaho white fir and hemlock logs could be purchased at prices ranging from $10 to $16 per M., or about $5 to $8 a cord.

Water power is, of course, readily available in Idaho, both developed and potential. Abundant deposits of local limestone exist.

Against these advantages there are several disadvantages which will tend to delay development of the industry. These are: 1. Restricted local market, 2. High freight charges to other markets, 3. Long freight haul on chemicals, 4. More expensive labor, 5. Pioneer conditions, 6. Heavy initial plant investments.

It is probable that these disadvantages will for some time offset the advantages, but they are all obstacles which will be gradually removed by westward movement of population, greater national demand for paper, and exhaustion of pulp wood supplies in the East. There is little doubt that the Inland Empire will eventually support a thriving paper industry, but how soon it will come about remains to be seen.

## FIRE RESISTANCE OF NORTHERN ROCKY MOUNTAIN CONIFERS

(Continued from page 10)

the larch. Its foliage is always young and moist. Then, too, when the leaves of western larch have all been killed by the heat of a slash-disposal fire in May the trees have been observed to put forth a second foliage about a month later and some of the trees appeared after a year or two to recover fully from the effects of the fire. It is doubtful if this occurs with any other conifer in this region.

The tolerant trees are the ones which retain their leaves for long periods. These tolerant trees are without exception of low fire resistance. Doubtless the leaf characteristics are one of the reasons for the low fire resistance. Persistent lower branches often hanging close to the ground and clad with half dry, resinous leaves are a great aid to the start of crown fires. Such trees can be touched off during a dry time with a torch, or even with a match in the lower limbs and will become a gigantic flaming torch in an instant. Inflammability of foliage is an important factor in this but it is usually abetted by the presence of lichen growth.

A heavy growth of lichens, commonly called "moss" by woodsmen, is one of the features of the forests on the west slope of the Continental Divide in this region. In the vast lodgepole pine forests east of the Divide the larger lichens are wanting and the others are of scant importance from a fire standpoint. West of the Divide but three species of lichens can be said to contribute materially to the fire danger. All of these are of the type known as "fruticose," in reference to their branching or shrublike form. One of the three is a yellow-green lichen very common on the dead limbs and bark of yellow pine and Douglas fir trees but also found to some extent on other species. It is rarely more than one and one-half inches long and is not very important from a fire standpoint although it does serve as tinder to carry fire up a trunk or to help ignite dry limbs. It is sometimes called "wolf moss" and I believe is now known to botanists as **Letharia vulpina.**

Our two really important lichens are known as "black moss" or "squaw hair moss" and "green moss" or "gray moss." Botanically the black is **"Alectoria fremontii"** and the gray-green one is **"Alectoris sarmentosa".** They are common from the Flathead region in Montana through Idaho north of Salmon River. They have been found on all of our common conifers and on a few of the larger shrubs. The black one appears to prefer the more open forests, the upper, and consequently more exposed parts of the trees, and the higher altitudes, but the two overlap heavily in range and in many instances both have been observed growing in profusion on the same tree. Neither species becomes abundant enough or large enough to be important from a fire standpoint in stands less than fifty years old and they aid greatly in giving the overmature stand the characteristic appearance of "hoary old age". Not infrequently on old trees, the volume of these lichens appears to be greater than the volume of foliage. They hang in festoons and tassels from the trunk itself and from every branch and twig. Single plants of either lichen may be from four inches to a foot or more in length, with a myriad of slender branchlets.

A peculiarity of both of these lichens is that they are very highly inflammable. During dry weather they may be lighted instantly with a match whereupon they flame up quickly and burn with sufficient heat to ignite dead

twigs and resinous green foliage. The lichens themselves appear to bear a resinous green foliage. The lichens themselves appear to bear a resinous or oily principle which causes them to burn freely even in damp weather. Burning festoons may be carried by even a light breeze from one tree to another. Thus these lichens form the light tinder which serves to ignite the heavier fuels and carry fire aloft in green tree crowns when they would not otherwise ignite. One must see their behavior in the presence of fire in order fully to appreciate their importance.

The present possibilities of practical application of this information are very limited. Under existing economic conditions and with very limited silvicultural experience and skill with these species, it seems rather improbable that the forester can do much to favor fire-resistant species or will desire to do so. Perhaps it may prove better business to eliminate the fires. Neither western larch nor Douglas fir are held in high esteem in this region at this time. It is conceivable that they may be regarded much more highly in the future. Their relative safety from fire is a point in their favor that may well be weighed with other things. The possibility of artificially extending the range of the really highly desirable and fire-resistant western yellow pine to better sites and consequent more rapid increment has been but little, if at all considered. Foresters and lumbermen in North Idaho are now in a white pine era. If the blister rust arrives, and if conflagrations continue to take such heavy toll of white pine, then they must in the near future turn attention to other species.

**Table Showing the Relative Fire Resistance of the More Silviculturally Important Northern Rocky Mountain Conifers**

| Species | Thickness of bark old trees | Root Habit | Resin in old bark | Tolerence | | Relative Inflammability of Foliage | Lichen Growth | Degree of Fire Resistance |
|---|---|---|---|---|---|---|---|---|
| | | | | Branch Habit | Stand Habit | | | |
| Larix occidentalis | Very thick | Deep | Very little | High and very open | Open | Low | Medium heavy | Most resistant |
| Pinus ponderosa | Very thick | Deep | Abundant | Moderately high and open | Open | Medium | Medium to light | Very resistant |
| Pseudotsuga taxifolia | Very thick | Deep | Moderate | Moderately low and dense | Moderate to dense | High | Heavy to Medium | Very resistant |
| Abies grandis | Thick | Shallow | Very little | Low and dense | Dense | High | Heavy | Medium |
| Pinus contorta | Very thin | Deep | Abundant | Moderately high and open | Open | Medium | Light | Medium |
| Pinus monticola | Medium | Medium | Abundant | High and dense | Dense | Medium | Heavy | Medium |
| Thuya plicata | Thin | Shallow | Very little | Moderately low and dense | Dense | High | Heavy | Medium |
| Picea engelmanni | Thin | Shallow | Moderate | Low dense | Dense | Medium | Heavy | Low |
| Tsuga mertensiana | Medium | Medium | Very little | Low dense | Dense | High | Medium to heavy | Low |
| Tsuga heterophylla | Medium | Shallow | Very little | Low dense | Dense | High | Heavy | Low |
| Abies lasiocarpa | Very thin | Shallow | Moderate | Very low dense | Moderate to dense | High | Medium to heavy | Very low |

From the ecological and floristic points of view a study of the fire resistance of the various species will yield considerable information in regard to the relations and distribution of Northern Rocky Mountain tree species. To the ecologist, rather than the forester, perhaps will this subject offer an interesting search for something more accurate than empirical information.

In summarizing it may be said that:

1. There is a great difference in degree of fire resistance between the species in which there is combined the greatest number of fire-resistant qualities and the species in which the fewest of those qualities are inherent.

2. There can be little doubt that western larch belongs at the top of a list made up in order of greatest fire resistance and alpine fir at the bottom.

3. Many of the trees between the bottom and top of the list are assigned their relative positions arbitrarily and may be moved when research has yielded added information.

4. The table lists the common commercial conifers in their order of apparent fire resistance and indicates the factors on which the order is based.

5. Present possibilities of practical application of information in regard to fire resistance of tree species appear very limited. The subject appears to be of considerable ecological significance.

## PROFESSIONAL ETHICS AS APPLIED TO FORESTERS

(Continued from page 12)

What is a profession anyway? If a man is practicing medicine does he belong to the medical profession? or if he is in charge of a tract of forest land and is engaged in growing trees on it, does he belong to the profession of forestry? Rather basic questions—the latter at least has agitated the Society of American Foresters from the day of its origin.

How does this definition sound? "A profession is a body of men who carry on their work in accordance with rules designed to enforce certain standards both for the better protection of its members and for the better service of the public. Its essence is that it assumes certain responsibilities for the competence of its members, and that it deliberately prohibits certain kinds of conduct on the ground that though they may be profitable to the individual, they are calculated to bring into disrepute the organization to which he belongs.

"The conception implied in the words 'unprofessional conduct' is therefore the exact opposite of the theory and practice which assumes that the service of the public is best secured by the unrestricted pursuit on the part of rival traders of their pecuniary self interest within such limits as the law allows. The object of the rules is clear. It is to impose on the profession itself the obligation of maintaining the quality of service and to prevent the common purpose being frustrated through the undue influence of the motive of pecuniary gain upon the necessities or cupidity of the individual." (2)

Notice the two planks in this platform. "It assumes certain responsibilities for the competence of its members." If forestry is as foresters believe, a profession requiring fully as broad and as thorough preparation as medicine, law or engineering, can foresters afford to waive this preparation, and admit to the **profession** large numbers of men whose training is wholly empirical? If so, they are doing something which no other organized profession has ever dared to do, for by this course, the profession assumes full responsibility for the quality of the Service rendered, and the influence exacted by these empiricists.

"It deliberately prohibits certain kinds of conduct calculated to bring into disrepute the organization to which he belongs."

Apparently, the formulated code, like the two tablets of stone (!), has a place in moulding a profession into shape. But, quoting from Heermance: "A code is designed to serve an immediate practical purpose. It is not a statement of general morality. It deals with the customs and ideals, the short-comings and the duties of a particular group of men. Ethical principles are stated in terms of daily experience. The code which falls short of this or attempts to go beyond is likely to become a series of platitudes."

If foresters are ever going to formulate a written code of professional ethics apart from the present generally accepted and unwritten code which has served the profession so admirably thus far, it will have to be the growth of discussion and experience based on the following tenets. 1. Are the acts in question capable of definition and detection? 2. Are these acts definitely harmful to other members of the profession? 3. Are they injurious to the welfare of the public? 4. Do they tend to impair

(2) Tawney, R. H., The Acquisitive Society. (Harcourt, Brace and Howe, 1920.)

the confidence of the public in the profession?

Since selfishness is at the bottom of every unethical act, and since the primary motive of the individual is personal gain, it follows that back of every unethical practice we find a distortion of the healthy principle of personal profit, into a form where this gain is sought in ways which violate one or more of the above rules. To be sure, a man's job may be imperilled in some instances unless he condones unethical practices on the part of his employer, but when it comes to a showdown, why should he think that he must literally sell his soul to the devil and actively sponsor these practices himself in order to earn a living in his profession. Better in this case make the choice between the profession and the living, and if the emoluments are not to be had professionally, seek them in some other field and retain one's self respect.

Foresters in private employ are not expected to bring about a millenium in private industry in a fortnight after they strike the job—but on the other hand they need not become tools and mouthpieces for the thwarting of public measures and the retarding of the progress of forestry. Nor is the forester employed in state or national service expected to remove by his own effort all the abuses, real or imagined, that may infest these organizations or render his superiors unfit to hold their jobs. Primarily, it is himself and his own attitude that needs his most serious attention. Occasionally it may be necessary to blow off the lid, or to seek a new job, but these crises do not occur as often as the inexperienced forester may imagine, and patience, forbearance and thorough insight into facts will often work miracles. The points formulated for discussion by the Committee on Ethics of the Society of American Foresters(3) show a grasp of some of these principles as well as indicating the difficulty of bringing them down to earth in a form capable of disciplinary action. Machinery for each action exists, but in only one instance has a member ever been disciplined. Bringing a case before the Executive Council means that some forester must prefer charges against a member of his own profession. These charges may not warrant expulsion, and the Council is empowered merely to reprimand the offender. But even this measure implies the submission of proof of the charge and this proof must be documentary or established by witnesses with as much care as if it were a case in court. When coupled with these conditions, we consider that the case is seldom of a nature resembling the commission of a crime, hence not only must the facts be proved but the motive established, or, in effect, a direct attack must be made on the professional honesty of the accused, in making the charge, when in every case involving motive he will be given full benefit of the doubt, the difficulty of actually resorting to such charges is obvious. If, to this, we add the fact that the member making the charges does not act anonymously but assumes the onus of the attack and the resultant hostility of the accused and his friends, and that he has no part in preparing the case or even in presenting it, not being empowered to collect evidence, which must be handled by the member in charge of admissions, there is not one chance in a hundred that a forester would be moved to act in such a case even for the benefit of the profession, or once having done so, that he would ever try it again.

In fact, the rule of professional courtesy which in its distorted form causes physicians to condone or conceal inefficiency of brother physicians, and members of other professions to seek to suppress all criticism of their profession, which spirit caused Bernard Shaw to make his caustic epigram "All professions are a conspiracy against the laity," this spirit might easily cause the accuser to be regarded as the more unworthy of the two.

Yet the report of this Committee urges the bringing of cases and their frank and open discussion as the very means by which the atmosphere is to be cleared and the standards crystallized. So we find ourselves in the usual dilemma, that when faced with the grapple of living forces we must wade in and get bruised if we ever expect to accomplish anything. There is nothing theoretical about a concrete case. Fortunately, it doesn't take many cases to clarify principles.

But in what way is the Society or the profession to benefit by bringing cases? Is the discussion of a man's professional honor to be spread broadcast in the magazine, if he is cleared of a charge? Or are the juicy facts to be printed if he is knocked out of the Society? If he is slapped on the wrist and told never to do it again are his professional brothers to be informed of the reasons for the admonition? Or is the soft pedal to be put on all cases, and the tongs used quietly to remove them at night?

The plain facts are that business men in

(3) Journal of Forestry, October, 1924. Page 89.

their associations have more courage in dealing with facts than have the members of a profession, and that written codes of business ethics are far easier to formulate the unwritten code of service and honor, and shrink from the raw contact with cases involving discipline. Personally, I believe that further efforts should be made to formulate a written code.

But certainly a change is needed in the present mechanism for preferring charges for no honorable man desires to make them anonymously and to make them as an individual, with no opportunity to follow them up, merely makes him a goat. Furthermore, no one man's judgment should be considered infallible. Personal animosity is generally suspected in such a case, and in a certain per cent of cases may exist. On the other hand, if at least three members were required to sign the charges the matter is at once relieved of this animus, and placed on a better basis. If the accuser cannot persuade even two other members of the validity of his case, or cannot find even that number who consider it worth investigating or who have the courage to demand such action, then there is no reason why he in turn should rush in. My one concrete suggestion is therefore that the Society of American Foresters would do well to amend its constitution to provide for this procedure in the future.

## PRODUCTS FROM IMMATURE WHITE PINE STANDS IN IDAHO

(Continued from page 16)

trees as might safely and profitably be cut at the age of 60 years. Three hundred well formed and rapidly growing trees would be a good number to leave per acre when the stand is 60 years old. Ordinarily another thinning should be made when the stand becomes 80 years old. The final saw timber crop might be removed when the forest becomes 100 years old.

## SOME METHODS USED IN GRAZING STUDIES

(Continued from page 20)

study of the application of deferred and rotation grazing, a number of plots are established and grazing is excluded until time of seed maturity. One plot deferred for one year, another for two years and another for three years, for example, will indicate the number of years that deferred grazing should be applied to improve the range. Other similar modifications may be tested with the use of the hurdle plot.

An enclosure commonly used for the hurdles is shown in Fig. 2. It consists of four panels; each panel being an open framework four feet high and 16 or 18 feet long, made of 1x4 inch and 2x4 inch lumber with woven wire nailed to the framework. When wired together at the corners, these panels form a very substantial enclosure. If made of light, durable lumber and woven wire, the panels will not cause climatic conditions to be changed on the plot sufficiently to interfere with plant growth, and the panels are convenient to move.

**Number of Sample Plots and Selection of Site**

The number of sample plots selected and their location depends upon the intensity of the study and the variety of conditions represented. Obtaining representative conditions is a prime consideration in the selection of the location. If circumstances limit the number, the plot or plots should be located upon the most representative plant type of the range unit under consideration. If a more intensive study is made, the types upon which the plots are to be located should be chosen in accordance with their relative importance on the range area involved. The same method should be followed in deciding upon the grazing conditions to be studied within each type. If the number of plots are limited, the most representative grazing conditions should be determined as the site for the plot. It would be unwise to select the more heavily grazed or the more lightly grazed portions of the type for the plot and attempt to apply the results for all conditions. On the other hand, if a more intensive study is planned, as many conditions as are prominent on the unit and the scope of the study will permit should be included. Studies of a specific condition, of course, would require that plots be located accordingly. As many protected plots should be established as are needed to check the conditions covered by the open plots.

All sample plots should be established, in sofar as possible, to avoid undue disturbance by local non-representative conditions. Ordinarily, a plot should be placed not closer than several hundred feet away from stock driveways, trails, roads, fences, watering and salting places, bed grounds, round-up grounds, etc. Judgment should be exercised

in so far as possible to avoid placing the plot or plots where any of these factors may enter in at a future date. Otherwise, valuable records and much effort may be wasted.

**Size of Plots**

Plots may vary in size from a few square feet or a portion of a square meter up to an acre or more, depending upon their purpose and the detail with which the data is obtained. Plots from a square meter, or thereabouts, up to 33 feet square are best adapted for most grazing studies. The smaller plots are used with the more accurate methods of obtaining and recording the data. It is seldom a good plan, however, to use a plot under a square meter because of the difficulty of obtaining representative conditions and avoiding error with such a small area. In many instances, two or more sizes of sample plots may be used in conjunction. In fact, this is very often desirable. For example, a major plot may be established for obtaining more general data, and a smaller plot located within the larger one, upon which detailed study is made.

**Marking Sample Plots**

It hardly seems necessary to mention the need for marking all plots permanently and "tying them in" to some permanent object. Yet these are matters very frequently overlooked which have led to the loss of valuable data. The practice should be to mark all the corners of each plot with a stake of some non-destructive material. Metal stakes or pins are best suited for this purpose. Wooden stakes may decay, be broken off by livestock, or be destroyed by rodents within a comparatively short time after placement. A very serviceable stake consists of a right angle "angle iron" one inch wide on the sides, made of one-eighth inch material, ten inches in length, sharpened or left blunt on the end. These stakes should be carefully inserted at the corners of the plot and driven down to within one or one and a half inches of the ground, so as to be disturbed as little as possible by grazing animals and to defy detection by any curious person who might disturb them. Where re-location of the plot may be difficult, a guide stake 2½ feet long, made of the same material, should be inserted and driven 1½ feet into the ground at a measured distance and bearing from the plot. Identification marks should be stamped on the metal stakes with the use of steel dies, or a small aluminum tag about the size of a 25 cent piece with appropriate marks should be securely wired to one of the stakes near the surface of the ground. Painting the metal stakes with red lead-oxide paint, which prevents rusting and

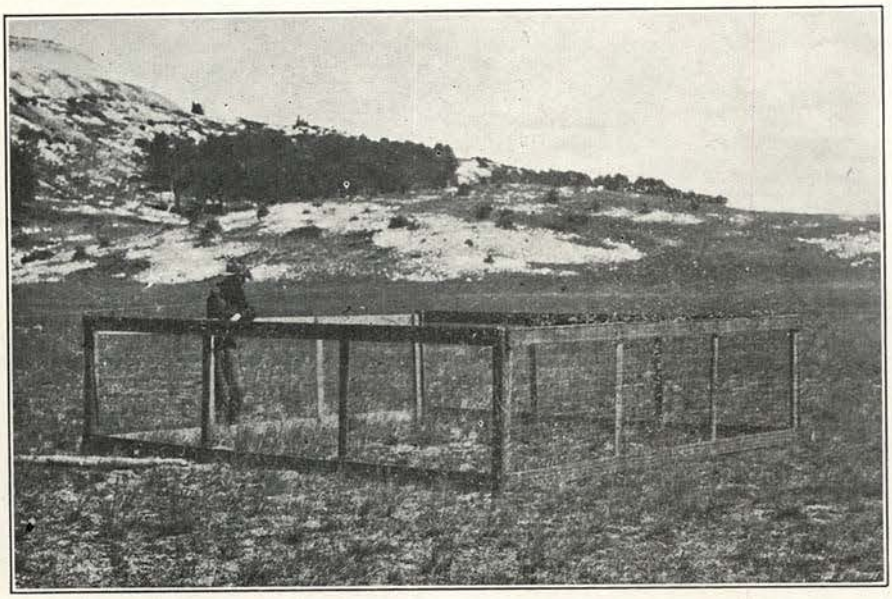


Fig. 2—Hurdle Enclosure. Enclosures of this nature are equipped with removable panel fences. Sample plots provided with these enclosures are of value for studying modifications in the time and degree of grazing.

preserves the identification marks, is desirable but not necessary. Round iron pegs one half inch in diameter may be substituted for the angle iron corner stakes, and ordinary gas pipe ¾ to 1¼ inches in diameter may be used for the guide stakes. The round iron pegs, however, are more difficult to stamp than those with a flat surface. The use of these indestructible stakes assures greater permanency of the sample plot.

When plots are situated on the open range, their re-location at a later date may be difficult unless their location is described with reference to some permanent point that may be found easily. It is a good plan, therefore, to "tie in" each plot by measuring and recording its distance and bearing to some such an object. Section corners, fence corners, springs, buildings, forks of a road or some other easily discernible object should be used for this purpose.

**Methods of Recording Sample Plot Data**

There are a number of ways of obtaining and recording the data, and sample plots are classified according to the method used. The basis for all of the methods is the **quadrat,** which, as the name implies, is a small square. This square is marked out upon the ground and a study is made of the vegetation within its boundaries. Investigators ordinarily find it convenient to use the meter as the unit of measuring quadrats because of the convenience with which it may be subdivided, although feet and inches may be used if desired. The various kinds of plots are (1) chart quadrat, (2) list quadrat, (3) combination list and chart quadrat, (4) tuft-diameter plot, (5) denuded quadrat and (6) major plots or quadrats.

**The Chart or Map Quadrat**

The chart quadrat is the most reliable method of showing complete detail. A map or chart is made of each quadrat established, showing each plant on the plot in its relative position and the area it occupies on the ground. Chart quadrats may vary in area, but the size most frequently used is a square meter. This has been found to be the best from the standpoint of including representative conditions, as well as that of time required for the work.

**Mapping Quadrats:** The equipment needed for mapping quadrats includes specially prepared tapes, map forms, pencil, scale, etc. Recently the pantograph, which is discussed on the following pages, has been perfected for charting quadrats, which speeds up and adds to the accuracy of the work. The tapes consist of two guide straps or tapes and four metal or leather boundary straps, about one-half inch wide and slightly more than a meter in length, perforated at 10 centimeter intervals and near the ends so that when pinned down at the ends in the form of a square, encloses an area exactly one meter square.

In establishing a quadrat, after the site has been chosen, the straps are first placed in position and fastened down with ordinary surveyor's pins, great care being exercised to have the straps conform to a true square. This may be accomplished by having the diagonals equal. The corner stakes should be driven while the straps are in place and on the inside of the quadrat. The general practice has been to place the corner stakes at the outside intersection of the boundary straps, which makes difficult the use of a quadrat strap with a width different than the original. Placing the stakes on the inside of the corners makes possible the use of straps of a different width at a subsequent mapping. When subsequent mappings are made, the quadrat straps may be located with reference to the corner stakes.

Fig. 3 shows a suitable type of form for quadrat mapping. This is merely an outline of the quadrat reduced to a scale of about one to five, showing the lines corresponding to the centimeter divisions on the quadrat and with the decimeter lines accentuated. Some investigators prefer a map form showing only the decimeter lines. The centimeter lines, however, are very useful in facilitating correct location of plants on the map and in compiling the data. Where a special form is not available, ordinary coordinate paper of adequate size serves very well.

In mapping, the individual plants are shown on the map form in the position corresponding to their location on the ground. Appropriate symbols are used for each species. Plants occupying less than a square decimeter are mapped as individual plants, merely inserting the symbol or a dot in addition to the symbol on the map, corresponding with the location of the plant on the ground. Clump-forming or tufted plants, i. e. plants occupying more than a square decimeter may be shown best by mapping the outline of the boundary line of the clump or tuft. In order to eliminate confusion in the case of plants which spread over the ground, the boundary of each tuft or clump should be mapped at

Fig. 3

PROJECT--Natural Revegetation

QUADRAT NO C-3

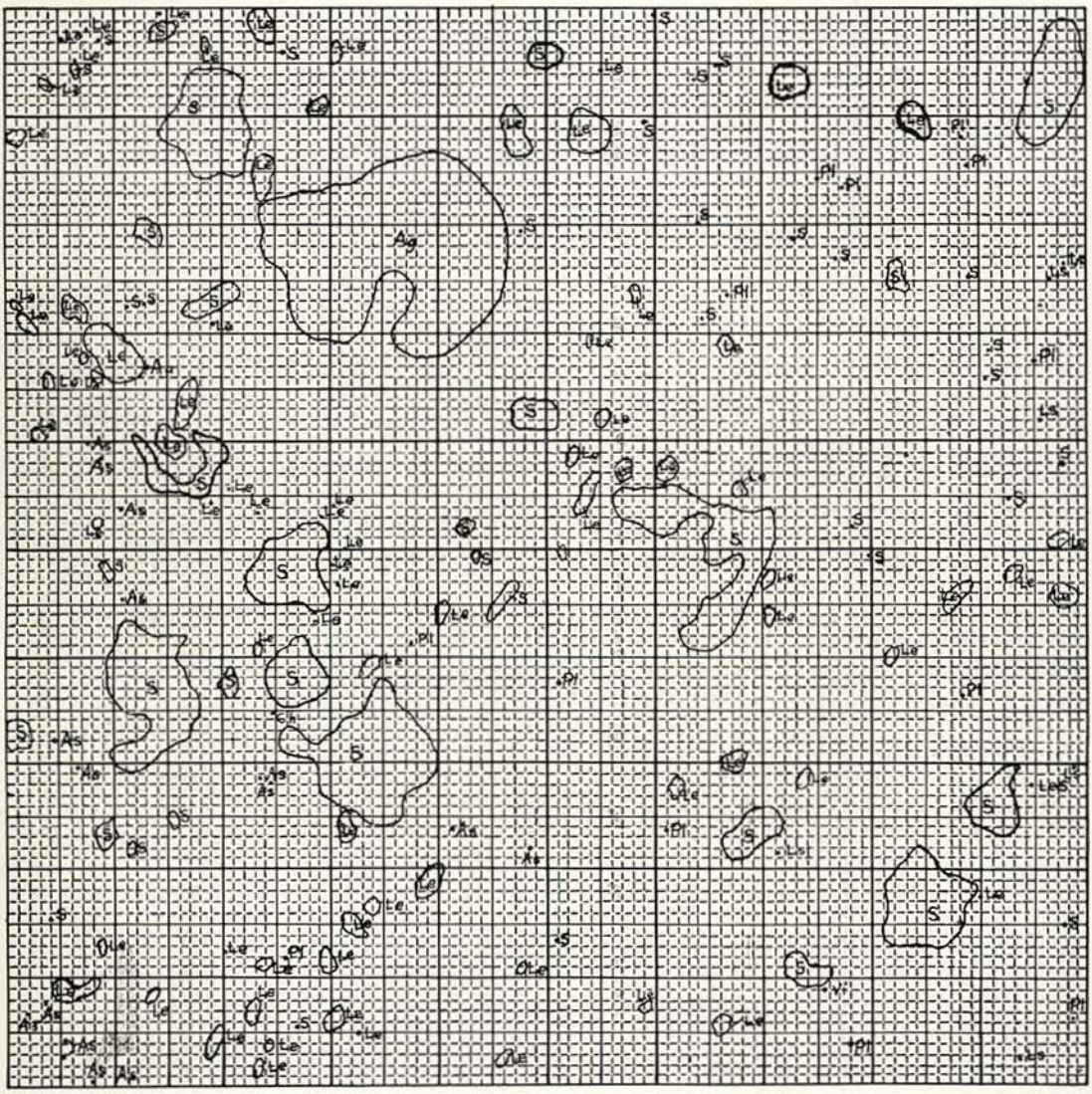
RANGE UNIT Cove

Established July 12, 1923

T 18 S -- R 4 E -- Sec. 28

Dates of previous mapping

Date July 12, 1923 Mapped by H.E.M. and C.W.W.




LEGEND

S: Stipa lettermanii
Ag: Agropyron violaceum
Le: Leontodon taraxacum
Vi: Vicia americana
Ls: Lesquerella kingii
Pl: Polygonum aviculare
Aa: Aster
Ch: Chenopodium album
Aa: Agoseris pumila

some standard height such as one inch above the ground.

Plants which spread by means of rootstocks present a somewhat different problem in mapping than do bunch-habit species, included among which are such species as **Pentstemon rydbergii, Achillea lanulosa, Agropyron dasystachyum and Agropyron smithii.** These plants may form large tufts within which there is incomplete cover. It is rarely practical to attempt to show each individual stem arising within these turfs; yet to show only the outline of the turf does not represent true density conditions and frequently other plants occur within them. A much truer representation of conditions may be had by mapping the boundary of the turf and estimating the density in terms of tenths of complete cover for each turf and entering this figure with the symbol for the species on the map. This then can be taken into consideration in summarizing the data.

In free-hand mapping, it is usually most convenient to start at one side of the quadrat, with the aid of the two guide straps lay off a strip one decimeter wide and one meter long, map the location of the individual plants and the outlines of the boundary of clump-forming and tufted plants on the first strip, and so on for each successive strip.

**The Chartograph:** Free-hand charting of quadrats, especially the more densely populated ones, is more or less a tedious and time consuming operation, which has limited their use to some extent. This objection is almost wholly eliminated by the use of a special instrument designed by Hill (8). This instrument is referred to as the "chartograph," and out of acknowledgement to the person who designed it may be termed the "Hill Chartograph." It applies the principle of the ordinary pantograph as shown in Fig. 4. Not only does it speed up the work, but eliminates mechanical and individual error. This instrument, with several refinements added, has been used extensively and with great success at the Great Basin Range Experiment Station. It has been found that two men are able to map four to five times as many quadrats in a day with the aid of this device as they were able to do working individually with the free-hand method. Not only was less time required and the work made less tedious, but it was more accurate and only one of the men needed


**Fig. 4.** Mapping a Quadrat with the Hill Chartograph. This device which adapts the use of the ordinary Pantograph to quadrat work, greatly speeds up, adds to the accuracy and removes much of the tedium in quadrat mapping.

to be familiar with the flora and skilled in charting work. The use of the chartograph has greatly broadened the use of the chart quadrat.

**The List Quadrat**

The list quadrat gives only the census of the vegetation on a quadrat. In listing, the quadrat is subdivided into units of convenient size and the census data is compiled for these units. Such records are of little value in grazing study work, except where the vegetation is made up of species, the individual plants of which occupy less than a square centimeter in area, such as annuals and non-clump forming perennials. This method does not take into account the area occupied by tufts or clumps or the density of the vegetation. In the case of grasses, for example, some species may form tufts several inches in diameter, yet under the list method they would be given no more consideration than an equal number of seedlings of the same species. Moreover, in a subsequent examination the larger clumps might be broken into several smaller clumps by overgrazing. The list data would show an increase in number of plants, whereas detterioration actually may have taken place. Obviously, such a method leaves much to be desired in the way of showing change in forage cover.

The list method serves a useful purpose however, for quadrats having certain classes of vegetation. The actual location of annual and single stemmed perennial plants on the quadrat map is usually of minor importance, and all essential features are shown by listing the number of plants of such species. The list quadrat, therefore, may be used to advantage on quadrats where there are no tufted plants.

**The Combination List-Chart Quadrat**

The listing of other than clump or tuft forming plants has led to a combination of the list and chart quadrats in grazing studies. On areas where both tufted or clump forming species and individual stem specimens occur, all of the essential information may be shown by mapping the tufted species and listing the individual stemmed plants within each square decimeter or other convenient unit of area. For example, on a quadrat occupied by **Stipa minor, Trisetum spicatum, Agropyron violaceum, Delphinium barbeyi, Polygonum aviculare, Collomia linearis and Sophia incisa** the first four specimens would be mapped and the last three listed. This simplifies and speeds up the work and at the same time obtains all of the data needed.

**Tuft-diameter Quadrat**

Another modification of the list or chart plot, known as the **tuft-diameter quadrat,** has been developed for certain purposes where refined detail is not essential. It takes into account the area occupied by plants which form tufts or clumps. This system is a generalized short cut wherein the areas are determined on the ground instead of from the map as in the case of the chart quadrat. While it is not as accurate as the chart method it may be used where complete detail is not necessary or impractical. It is especially adapted for quadrats over a square meter in size.

The tuft-diameter method of recording quadrat data involves (1) listing the number of tufted species according to diameter, or (2) showing the approximate location of the tuft forming plants with a circle within which the diameter of the tuft is recorded. Under the first method, the diameter class ranges of the plant tufts to best suit the nature of the vegetation on the quadrat, such as O-2cm., 2-4cm., 4-6cm., or 0-2 ins., 2-4ins, 4-6 ins., etc, are first decided upon. The diameter of tufted plants in each subdivision of the quadrat is measured and listed in its appropriate diameter class. All the non-tufted plants are listed in the usual manner. In the second method a circle is used to represent the approximate location of the plant on the quadrat, the diameter of the tuft is measured and this figure is entered within the circle. The average of two diameter measurements of each tuft taken at right angles to each other is usually sufficient to determine the diameter of a tuft. With these data as a basis, it is possible to arrive at a fair approximation of the area occupied by each species on the plot.

**The Denuded Quadrat**

Some investigators have used the depopulated quadrat to determine rate of improvement of range following denudation. The process consisted of establishing and charting a quadrat and then artificially removing the plants upon it, after which reoccupation of the area by vegetation is watched. This method is unreliable and of little value in grazing studies. In the first place, a wholly different soil condition results from artificial denudation as compared to denudation by overgrazing. Secondly, the quadrat would be reseeded quickly from the nearby vegetation, a condition which is not so favorable under denudation by overgrazing. The only reliable

method of determining the rate of improvement of denuded range is to select sample plots on areas where the vegetation has been badly depleted or denuded by overgrazing.

**Major Quadrats**

Sample plots larger than a square meter up to several square rods in area are ordinarily called major plots or major quadrats. Two very convenient sizes to use are plots one or two rods on a side, or the approximate equivalent in meters. Major plots are used to obtain data in less detail, but for larger areas than the meter quadrat. Hence major quadrats are seldom mapped, but some other method of obtaining and recording the data is used. The best plan is to use a major plot for obtaining the more general data and a chart or combination chart-list quadrat within the major plot to show the detail.

A method frequently used for obtaining the data on major quadrats is as follows: The entire plot is divided into convenient subdivisions. The density or the percentage of the ground occupied by vegetation for each subdivision is carefully estimated by eye, the plant species on each subdivision are listed and a careful estimate made of the percentage that each species makes up of the total vegetation on that subdivision. Summation of the species, percentage of each and density for each subdivision will give the composition, density and percentage that each species makes up for the vegetation on the plot as a whole. Although this system introduces the element of estimating, which is objectionable from the standpoint of careful work, it has been found that experienced investigators are able to obtain highly reliable results. The larger area involved and the greater number of plots which may be recorded in a given period as compared to the smaller chart quadrat offsets much of the error.

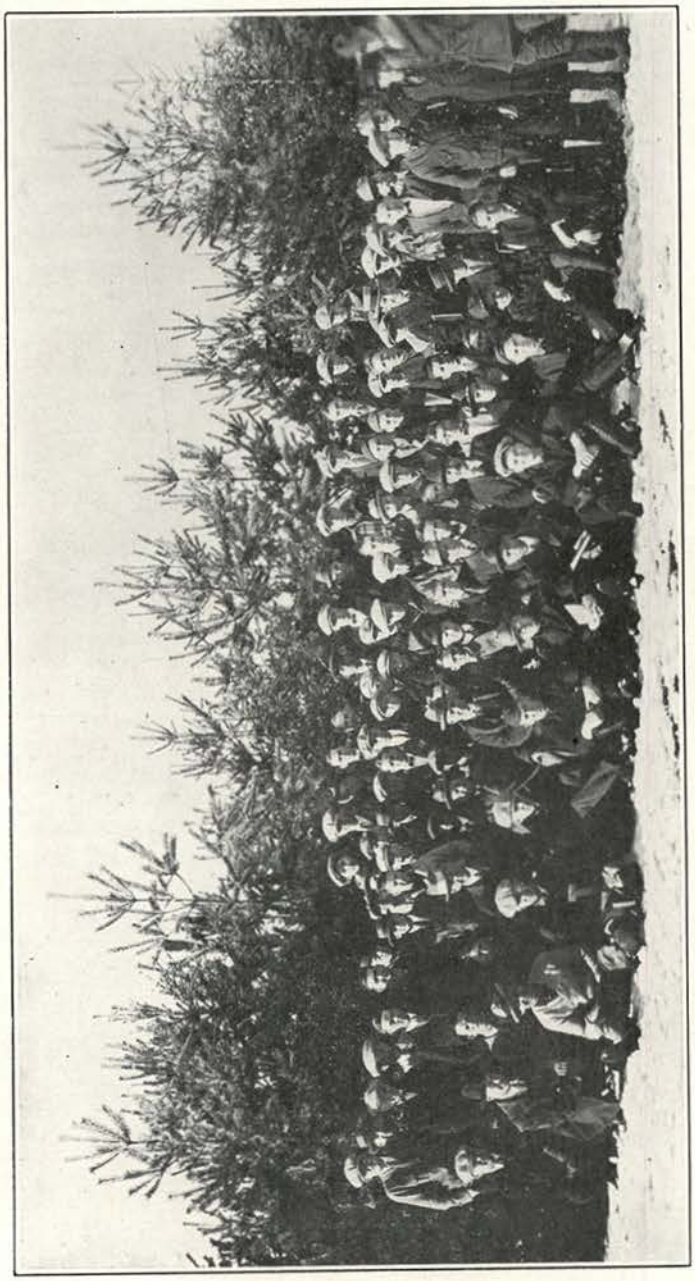
Another advantage of the density and percentage of species estimate is found when converting quadrat data into terms of carrying capacity, since it involves the same principles used in making forage estimates. Forage estimates take into account the density, composition and palatability of the vegetation. **Density x palatability** gives the **forage acre factor. Forage acre factor x surface acres** of the type or range area involved gives the number of forage acres, and knowing the forage acre requirement per animal per month as determined from carrying capacity tests it is largely a matter of mathematics to determine the number of animals a range unit will support. Hence the density and percentage of species estimated on the sample plot, together with a knowledge of the palatability percentage of each species, makes it possible to compute the carrying capacity and subsequent changes directly from the sample plot data. When a major plot, in connection with a chart quadrat, conversion of the chart quadrat data into terms of carrying capacity is facilitated and made more reliable.

Where a more precise method is desired, and if the plot is not too large, the tuft diameter method of charting or listing may be used.

**Season and Frequency of Mapping**

Maps or other records of plots should be made at the time of year when the vegetation is near its maximum development and prior to a time when grazing or drying up of the plants will render their identification or detection difficult or impossible. This is usually from a month to six weeks after the growing season begins. On many sites annuals and some of the early perennials may dry up before the later perennial vegetation has reached the height of its growth. Where both earlier and later maturing species occur on the same quadrat, charting should be done, if possible, at a time when both kinds of vegetation can be identified. If the period of development of the two are too widely separated to map both at one time, an early and a late charting becomes necessary. In localities where there are two distinct rainy periods and consequently two growing seasons, as in parts of the southwestern United States, it is usually necessary to map once and sometimes twice in each growing season.

Frequency of mapping depends upon climatic conditions and the purpose of the study. The most detailed record would be obtained if the plots were mapped each year or as many times in each year as is necessary to obtain a complete record of the seasonal phases of vegetation. Such great frequency, however, is not essential to show the trend of the vegetation and very often is not practical because of the amount of time required. Under average conditions it takes about three years for the vegetation to show any response to a method of grazing. Hence, mapping quadrats every three years would be often enough for all practical purposes under average climatic conditions. Growing conditions, however, are subject to variation because of fluctuation in climatic conditions. In the Southwest, for example, where rainfall is normally low and



ASSOCIATED FORESTER, 1924-25

erratic, the vegetation may vary in some years as much as 50 per cent or more above or below average. Where such variations occur, it is necessary to map the quadrats to determine the effect of the climatic fluctuations. A safe rule, therefore, is to map quadrats at three year intervals with sufficient intermediate mapping to take into account variations in density and composition of the vegetation due to fluctuations in climatic conditions.

Quadrats for special purposes may be mapped at greater or less intervals than three years. Where a method of grazing is being tried out, each method should be continued for not less than three years and as many more years as is necessary to obtain conclusive results. In such cases the quadrats should be mapped at the beginning of the study, again in the third year thereafter, with additional chartings during or immediately after abnormal seasons, and then every two or three years until the study is completed.

**Photographs**

Photographs are highly valuable for showing general conditions on quadrats. Wherever possible, therefore, a photograph should be taken each time a quadrat is mapped. The location of the camera when the first photograph is taken should be marked with a stake so that each subsequent exposure may be made from the same angle and distance. This will facilitate comparison of one photograph with another.

**Other Data**

As complete a history as possible of conditions attending the plot should be made in addition to mapping or listing the vegetation on a sample plot or quadrat. The record made at the time that a plot is established should go as far into past history as possible. On subsequent examinations only the incidents that have occurred since the last examination need be recorded. The back of the quadrat map is a convenient place to record this information. The points to be covered and a method of recording the information are shown in Fig. 3.

**Compilation of Quadrat Data**

The procedure in compiling quadrat data varies with the method of recording the data, object of the study and the preference of the individual doing the work; hence it is difficult to describe the methods in much detail. The summarization of the data on the chart quadrat, however, is practically the same in all cases. The number of individual specimens for each non-tufted species on the quadrat are counted and totaled. The area occupied by each tufted specimen is determined with a planimeter or when the finely divided map paper is used by counting the number of centimeter squares within the boundary line of each tuft. The most convenient method is to planimeter the larger tufts and count the square centimeters for the smaller tufts. These figures are then summarized for the whole quadrat to show the number of specimens of each for the non-tufted species and the number of specimens for each tufted species and the total area occupied by each species. These data are then compared with similar data for previous mappings and the increase or decrease in number of species, number of specimens and area occupied by tufted species is shown in terms of percentages.

**Figure 5—Form for Back of Quadrat Sheet**

Specific Object of Quadrat.....

.....Size of Quadrat .....

Location .....

Character of Site: Elevation..... Exposure..... Slope.....

Soil .....

(Origin, depth, texture, humus, moisture holding capacity, etc.)

Plant Type .....Density of vegetative cover (in tenths).....

Principal species and percentage of each.....

.....

.....

.....

.....

.....

.....

History of Range Use: Past: .....

(Cut over, burned over, class of stock, character of

.....

grazing, period of use, etc.)

..... Present: .....
(Class of stock, periods of use, degree of grazing,
.....
system of handling stock, deferred and rotation grazing, etc.)
Growing Conditions: This year: .....
(above, below or average)
..... During years since last charting .....
.....

Vigor and life history of principal species:
Period of growth .....
Heigh, growth and luxuriance when mapped .....
Time of flower stalk production .....
Time of seed maturity .....
Size of seed crop .....
Remarks .....
.....

SUMMARY OF QUADRAT DATA

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Symbol | | | | | | | | | | | | | | | | | | | |
| Value for forage* | | | | | | | | | | | | | | | | | | | |
| No. specimens | | | | | | | | | | | | | | | | | | | |
| Area occupied | | | | | | | | | | | | | | | | | | | |

| | Last Mapping | This Mapping | Increase or Decrease |
|---|---|---|---|
| Total ( 1) Number of species | | | |
| ( 2) No. good forage species | | | |
| ( 3) No. medium forage species | | | |
| ( 4) No. poor forage species | | | |
| ( 5) Number of specimens | | | |
| ( 6) No. good forage specimens | | | |
| ( 7) No. medium forage specimens | | | |
| ( 8) No. poor forage specimens | | | |
| ( 9) Area occupied | | | |
| (10) Area occupied by good forage species | | | |
| (11) Area occupied by medium forage species | | | |
| (12) Area occupied by poor forage species | | | |

*(G) good forage; (M) medium forage; (P) poor forage.

The writer has used a system of tabulating grazing studies quadrat data for a number of years which readily shows what the change in plant cover or succession is, that has been found very satisfactory. This method takes into account the forage value and life period of each species. The system of classifying the species and tabulating those data is shown in Figure 6.

**Fig. 6—Tabulation of Quadrat Data by Years**

**Quadrat No.** .....

| | Good Forage Plants | | | | | | Mdm. Forage Plants | | | | | | Poor Forage Plants | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Perennials | | | Annuals | | | Perennials | | | Annuals | | | Perennials | | | Annuals | | |
| Species Symbol | | | | | | | | | | | | | | | | | | |
| Year | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

(1) Area in square centimeters or (2) number of specimens.

By using the same vertical column for each species each year or time of charting, this form shows at a glance the coming in of new species or disappearance of former species, forage value and life period of each, as well as the change in number of specimens or area occupied by each. A sufficient number of vertical columns should be provided under each subdivision to show all the species that may be had or may come in during the period covered by five chartings. This form of tabulation may be adapted to show any other classification of the vegetation that may be desired.

**Determining Other Factors of the Habitat**

Where more intensive studies are being carried out, it is essential for the investigator to take into account the other factors which affect plant growth. The more important factors with which the grazing student is concerned include precipitation, air temperature, soil temperature, soil moisture, evaporation, transpiration, insolation, nutritive properties of the soil and biotic factors. Humidity of the air and wind velocity are secondary factors which are integrated in so far as study of the habitat is concerned in the evaporation and transpiration factors. Methods of measuring these factors have been described by Clements (9), Bates (10) and others. The study and determination of the part that each of these factors play in plant growth and forage production are ordinarily undertaken only at experiment stations or other similar places where intensive studies of long duration are carried on.

As has already been pointed out, except for the grazing factor the grazing student is most concerned with the part fluctuation in climate plays in forage production. This may be determined empirically by phenological records beginning with the inception of growth and continued until the close of the growing season together with measuring the forage production near the end of the growing season on a number of sample plots. Where necessary equipment is available it is desirable, of course, to measure the climatic factors, including precipitation, air temperature, soil temperature, soil moisture and evaporation.

The permanent sample plot is the basis of the forage production study and they should be selected and marked in the same manner as for other sample plots. An area about 16-½ feet square is the most convenient size for each plot. Observations on the plot should begin with the inception of growth in the spring and be continued at suitable intervals until

the end of the growing season. The information collected for each important species should be sufficient to show (1) inception of growth; (2) date when ready for grazing; (3) period of flower stalk production; (4) period of blooming; (5) period of ripening of seed; (6) period of seed dissemination; (7) time when seed has all been disseminated and (8) cessation of growth; (9) average length of leaves, average length of flower stalks and total number of flower stalks and flowers produced; and (10) remarks to indicate injury from rodents, disease or other biotic factors. Shortly after the time of seed maturity and before seed dissemination the vegetation on one-half of the area is harvested, dried and the air dry weight determined. Cutting of the vegetation at harvest time should be made at a standard height for all plots and at a height which will not affect the natural development of the plants in subsequent years. Two inches above the ground is satisfactory for most species.

Records over a period of years, showing the variation in the development of the vegetation and yield for each year will show (1) the variation in forage production from year to year, (2) the variation in the time of vegetational readiness*, (3) the time of seed maturity of the important forage species and the variation in the time of seed maturity. This information will serve as a basis for making adjustments in the numbers and handling of livestock and in the time of opening the grazing season that may be necessary to meet years below the average and as a foundation for the application of deferred and rotation grazing.

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1—The stage of development that a plant should reach in the early part of the growing season before grazing begins.

## TO THE WIFE

(A Tho't on the Home Trail)

Now when I think of little things,
Of flower, whim or stone
That turned my feet o'er unmarked ground
Where wandered I alone—

Now that I know how long the way,
How wonder, dark the night,
How many chances to be wrong
When but one way is right—

And when I think of little things
That may have led your feet
O'er virgin ways, I wonder, dear,
If we but **chanced** to meet.

Stanley Foss Bartlett (R. C.) '21-'22.

## IDAHO FORESTRY BULLETIN FILLS LONG FELT WANT

The Idaho Forestry Bulletin, published by the School of Forestry of the University of Idaho is filling a long felt want for some means of furnishing the people with information concerning the forests and forest industries of Idaho. This bulletin, a multigraphed paper, was first published a year ago last January and is issued monthly except in the months of July, August and September. In this short period of time the mailing list has increased from a bare one thousand to over sixteen hundred and requests to be placed on the mailing list are coming in continually. The Bulletin is used in many of the public schools of the state, more particularly by teachers in geography and agriculture.

Any or all of these bulletins may be secured free of charge by writing the School of Forestry, University of Idaho, Moscow, Idaho. The titles of the bulletins published to date are as follows:

Volume I.

No. 1. The Forests of Idaho.

No. 2. The Lumber Industry in Idaho.

No. 3. The Trend of the Lumber Industry in Idaho.

No. 4. The Forest Fire Situation in Idaho.

No. 5. The Forestry Situation in the United States.

No. 6. The Forest Resources of the World.

No. 7. White Pine Blister Rust in the Pacific Northwest.

No. 8. The Fire Season of 1924—A Brief Review.

No. 9. The Clarke-McNary Forestry Act.

Volume II.

No. 1. A Forest Policy for Idaho—Why Needed?

No. 2. Forests and the Conservation of Irrigation Water Supply.

No. 3. National Forests and Road Development.

No. 4. Idaho in Forest Protection.

No 5. Idaho's New Forestry Law.

No. 6. Forests and Recreation.

# IDAHO'S NEW FOREST LAW

The forestry bill passed by the Idaho legislature at its recent session and signed by the Governor March 5, marks the culmination of a long time effort to secure for Idaho a law which would give reasonable assurance of permanency in timber production on her forest lands. But at length the effort is rewarded, for Idaho, altho among the very last of the timbered states of the union to act, now has one of the most progressive forestry laws yet written. The new law supersedes the old Fallon fire law tho retaining the good features of the latter.

The law is predicated on the belief that if forest fires are controlled the problem of keeping Idaho's forest land in a state of continuous forest production is largely solved. But any forest law calculated to control forest fires in Idaho must provide for three essentials—executive officers to enforce the law, rational methods of slash disposal, and an adequate protective organization for all forest lands, whether cut-over or bearing merchantable timber.

The law meets the first essential thru the creation of the office of state forester, and a state cooperative board of forestry. The state is exceedingly fortunate in having available as its first state forester, Mr. Ben E. Bush, whose appointment is referred to on another page. He will retain his office at Moscow.

The general administration of the law is vested in a non-political board known as the state cooperative board of forestry, consisting of the governor, as chairman, the attorney general of the state, secretary of state, state auditor, state superintendent of public instruction, state land commissioner, state commissioner of reclamation, dean of the school of forestry at the university, and four citizens of the state, appointed by the governor. Two of the four appointees are nominated by the timber protective associations, one by the livestock industry, and one by the U. S. Forest Service. It will be noted that the board is representative in character, all interests most directly concerned in the use of the forest having membership on it, thus giving the greatest assurance of an impartial administration of the law. A representative board also enlists at once a larger public interest in the success of the law than would otherwise be the case. Its unwieldiness is largely offset thru executive committees consisting of three members each, chosen by the board to represent it in the field in the administration of previously adopted policies, rules and regulations.

The second essential is fulfilled by the slash disposal section. This provides that the slash created incident to logging shall be piled and burned unless another method of disposal is authorized by the state forester.

The broadcast burning of the slash as has been the practice under the Fallon Act not only defeats any reforestation program, but is a failure as a fire preventative measure. That old logging works on which the slash has been disposed of in this way, have been repeatedly burned over is the rule rather than the exception with the result that any natural reproduction is either impossible or long delayed. Probably the bulk of the cut-over lands of the state is in a non-productive condition as a result of repeated fires.

By piling the slash before burning, most of the young growth left after logging is saved, reproduction is practically assured, and the fire hazard is reduced to a minimum. This method of slash disposal is not an experiment. It is in general use on both government and state lands in Idaho, and in more recent years has been adopted by some of the larger operators.

The third essential is met thru the provision that all the forest lands of the state shall be divided into districts to be known and designated as forest protective districts with a view to giving each district adequate and effective protection, the cost to be borne equitably by all owners, aided by federal funds.

Under the old Fallon Act the state was districted only in part, since all protection of private lands was entirely voluntary. a large part of the cut-over land was outside the boundaries of the officially organized protective districts. These lands were commonly known as "no man's lands," and received no protection whatever. Under the new law all such lands will be included in regularly organized districts. This will be done either by extending the boundaries of the districts already organized or by the creation of new districts.

By prorating the cost of fire protection among all owners as the new law does, the

average per acre cost will be substantially reduced. For example, one large association finds that the cost per acre for 1925 figured under the old Fallon Law would be 11.3 cents whereas under the new law the cost will be 6.6 cents, a saving of 4.7 cents per acre. This cost will doubtless be still further reduced by additional federal funds which will be made available this year.

The timber protective associations built up under the old Fallon Law will not be disturbed by the new law, but will continue to function just as formerly.

The new law carries many other features which serve to clarify and strengthen the main essentials. The cooperative board held its organization meeting at Boise, March 16 to 18 to launch the new law and it is now in full force and effect. Governor Moore and many others prominent in the affairs of the state have pronounced the forestry law to be one of the outstanding acts passed by the last legislature. It is at once constructive and far reaching.

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In commenting on the law for **The Forest Patrolmen,** Mr. Bush says: "Our new Forestry Law, at this time, seems to be working out very satisfactorily. The lumbermen who are most interested are paying a great deal of attention to the several provisions of the act, and I am confident that it will be fairly well appreciated after one season's operation.

"We have, at this time, created twenty-five districts in the State, covering by far the greater part of the forested area. There are still some isolated districts that should be provided for and I think that we will have these taken care of by the beginning of next year.

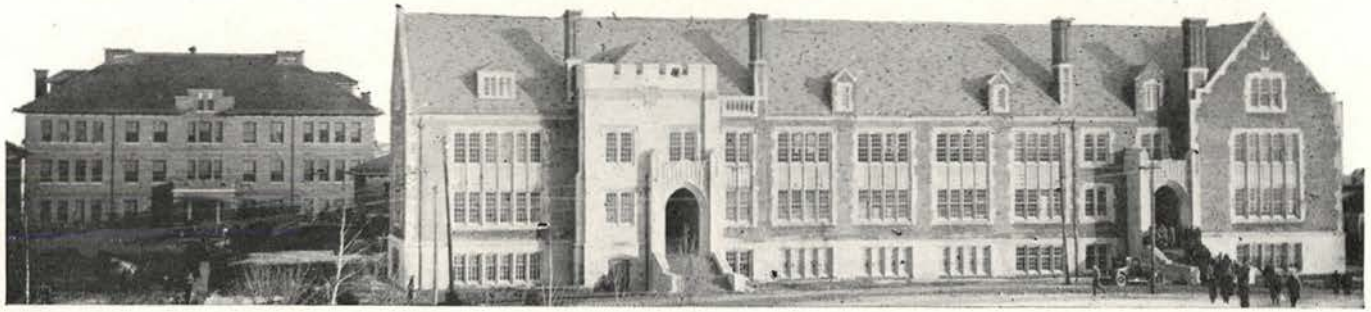
"The public, in general, seems to be very much interested, and we have a very large demand for copies of the law and are distributing them over the State.

"We have had some small objection to the compulsory feature and have had some very commendatory responses from others who want to pay for the protection they receive.

"So far, we are working a good deal on the line of former years, i. e., through the organized timber protective associations, and have organized some new ones. We are also cooperating with the Forest Service and they are giving us the most hearty support. Everyone connected in any way with the forested area realizes that slashings are our greatest enemy in the way of a fire hazard, and we are getting better support in the way of disposing of this menace than we ever had before.

"The weather thus far has been ideal for protection and we are hoping that we will have a season like 1916, when we had practically no fires. However, should the weather turn hazardous we are in better shape to handle bad conditions than ever before."

## NEW SCIENCE HALL



Science Hall is a handsome structure of Tudor-Gothic architecture, fire-proof, built of reinforced concrete, faced with brick and stone trimmings, and roofed with slate. Its three stories and attic are designed thruout to provide accommodations for instruction in the sciences. Its central section is 120 feet long, and its east and west wings each approximately 40x68. Large laboratory rooms occupy most of its space. An octagonal lecture room, 45x56, with inclined floor and seating capacity for more than 250 students, occupies the top floor of a two-story north wing. Present cost of this building, as provided for by millage tax levy, has been $180,000. Interior completion and installation of equipment will cost $125,000, which sum is available by legislative appropriation. The building will be ready for occupancy by the opening of the new year. Morrill Hall, shown in the background to the left, is the present home of the School of Forestry.

# FORESTRY AT WEST POINT

Mr. E. W. Chamberlain, writing of his experiences at West Point makes the following interesting comment on the West Point Forest:

"The West Point Forest, comprising that timber land included in the boundaries of the West Point Military Reservation, New York, is one of the most successful experiments in applied forestry in the East. While the timber crop is perpetuated primarily for its scenic value rather than its economic value, still the principles involved are the same and the result has been very satisfactory. The management is directly under an officer who is designated as the Chief Forester and it is the writer's opinion that he has every tree down to the smallest seedling counted and if one is missing investigation begins at once.

"Fires are practically unknown as campers are not allowed in the forest. The nearest railroad is miles away, and thunder storms are rare. Cutting on the reservation is allowed only by permit and only certain designated trees may be cut. The stand itself is almost all hardwood—chiefly maple and oak with some beech.

"The writer's opportunity for observing the practice of forestry here was limited but to judge from the result—a healthy, prosperous and growing stand of timber—the practice has been overwhelmingly successful."

Editor's Note: Mr. Chamberlain enrolled in the School of Forestry, University of Idaho, with the class that graduated this spring but left school to accept an appointment at the U. S. Military Academy, West Point, N. Y. He is visiting his people in Moscow on his first furlough from the academy and expects to be here most of the summer. Mr. Chamberlain will begin his third year there this fall.

## SENIOR FIELD TRIP

Accompanied by Supervisor C. K. McHarg and several of his staff, the senior class in forestry spent the week beginning May 18 in an inspection trip over the Coeur d'Alene National Forest. Mr. A. A. Brown, technical assistant, gave the class a very thoro discussion of the management plan of the Coeur d'Alene Forest, going into particular detail on problems relating to regulation of the cut in order to insure a sustained yield. With the management plan in mind, the class journeyed by way of Garwood and the very excellent logging road of the Ohio Match Company to the logging camp of this company's timber sale where the greater part of the week was taken up in a study of marking methods and slash disposal. One day was devoted to actual timber marking under the supervision of experts of the Forest Service.

Trips were made to cutting areas, showing reproduction after logging, various methods of piling and burning slash, and sanitary measures taken to rid the forest of inferior species so as to favor reproduction of white pine, and areas exhibiting different age classes.

Students making the trip were Lewis A. Cummings, Paul M. Harlan, C. H. Hunter, D. R. Malhotra, R. P. McLaughlin, E. W. Renshaw, E. A. Snow and Ralph S. Space.

The class unanimously voted the trip to have been one of the most instructive it had yet made, and wishes to express cordial thanks to Mr. McHarg and his assistants; to Mr. Pearl Bailey, western manager of the Ohio Match Company, and members of his organization; and to the Winton Lumber Company for courtesies extended.

## SUMMER FIELD WORK

The forest faculty is occupied during the summer moths with important field investigations. Dr. Henry Schmitz has three parties of two men each in the field on black currant location and eradication as a measure in the control of white pine blister rust. This work is carried on in cooperation with the Idaho department of agriculture and the office of white pine blister rust control, U. S. department of agriculture.

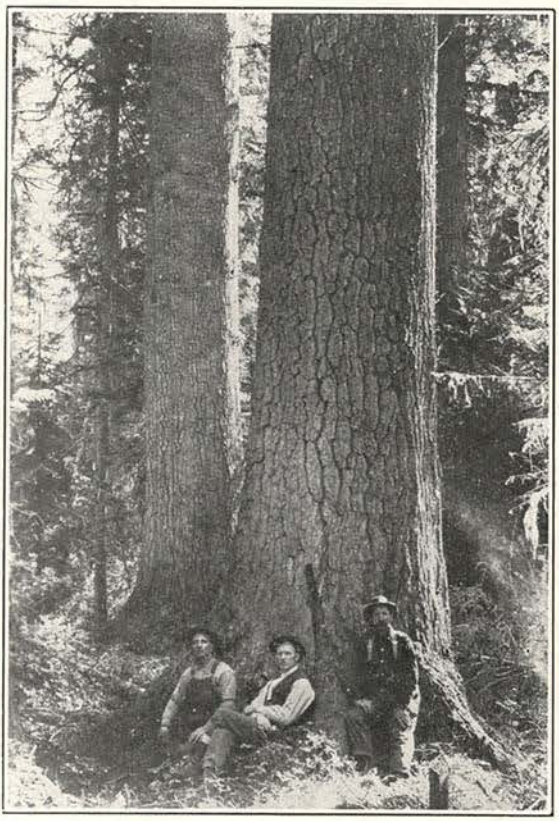
Prof. C. W. Watson, with two student assistants, is engaged in a study of the contents and rate of growth of white pine stands following old burns, with a view to determining how soon these stands will be ready to cut and the yield that may be expected. There are many such stands in the white pine belt, and if protected from fire, they will become valuable holdings in the near future. This is Prof.

Watson's second season on this study.

Prof. H. I. Nettleton, assisted by two students, is continuing the study undertaken by the School in the summer of 1923, on the growth of white pine left on old logging works. His studies show that these residual stands have taken on an increased rate of growth following the removal of the older trees, and that they will be ready to cut in a comparatively short time.

Dean F. G. Miller is completing his report on the university timber lands, a study started last summer, and in cooperation with the Forest Service is gathering statistics on the secondary wood using industries of the State.

FORESTRY FIELD LABORATORY PARTY



Typical Idaho White Pine Forest

### FORESTERS, A COSMOPOLITAN GROUP

Just one-half the states of the union, besides India, the Philippine Islands, and Canada were represented in the enrollment of the School of Forestry for the year of 1924-25. In point of numbers, Idaho, of course, stands first, with a total of 52. Naming the other states, and countries alphabetically, with the number of students from each, we have: Arizona 1, California 2, Connecticut 1, Delaware 1, Florida 1, Illinois 6, Indiana 1, Iowa 1, Kansas 3, Louisiana 1, Massachusetts 5, Michigan 2, Montana 1, New York 8, Ohio 2, Oregon 5, Pennsylvania 2, South Dakota 1, Tennesee 1, Texas 1, Utah 4, Washington 15, Wisconsin 1, Canada 5, India 1, Philippine Islands 3. Of the 127 registered, 108 were long course students, and 19 were members of the ranger course.

Students are attracted to Idaho on account of the superior advantages for forestry training; for situated as the school is, near extensive private, state, and national forests, large logging, and milling operations, as well as secondary wood using industries, unusual opportunity is afforded for practical experience in the woods to supplement class-room work. These conditions also make it possible for students to secure ready employment both during vacations and on the completion of their courses.

### RANGER COURSE

The ranger course to be offered again next winter, will open January 4, and close March 26. The giving of the course is one of the major activities of the school, and is conducted independently of the long courses. It is planned for men either in the Forest Service, or connected with some phase of the lumber business. Admission is by special application, and only a limited number of high class men will be accepted.

### DEMONSTRATION FOREST, A BOON

The recently acquired 640 acre forest, near Moscow, for use by the School of Forestry, as a field laboratory, and demonstration forest, is more than meeting expectations. It is especially valuable for field work in silviculture, and the class in this course, the past semester under the direction of Prof. C. W. Watson, made an intensive silvicultural description of the entire tract.

## THE RANGER'S PRAYER

Oh, Lord in Heaven, hear our plea, give us high humidity;
Spare us trouble, work and pain; send us stormy skies, and rain!
Teach the folks these summer days "Prevent Forest Fires—It Pays";
Keep the lightning from our pines, keep the sheepman in his lines;
Make the cowman know his fault when he fails to put out salt;
Teach the timberman to blush when he fails to pile his brush;
Make us wise to understand these new Manuals at hand;
Make our Supervisor wise, hide our boneheads from his eyes;
Hear this, our meek request, and then we'll do our very best. Amen.

—H. R. Elliot, Malheur National Forest.

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## THE FOREST FIRE

Who was careless, no one knows;
Yet the fire goes, goes,
Flaming gold.
Now it makes a sudden sally,
Leaving in a once-green valley
Woe untold.

Watch it jump, higher, higher;
'Tis an ancient funeral pyre,
Burning bright.
Like some demon or a devil,
In a sort of drunken revel,
In the night.

Burning this way, burning that,
Laying forests in a flat,
Smouldering mass.
What an orgy now it makes!
Every living thing it takes,
To the last.

Wood folks running helter-skelter,
Looking for some kind of shelter
From the heat;
Running on before the roar,
Run till they can run no more,
With blistered feet.

Then advancing in a cloud,
Laughs the flame fiend in a loud,
Terrific crash;
And the sturdy little band
Perish bravely, as they stand,
In a flash.

On the one who is the cause
All the vigor of the laws
Should be brought;
He should suffer just the same
As the victims of the flame
He has wrought.

—Earl MacTowner, in American Forests and Forest Life.


# Results

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