1939

# The Utah Juniper, Volume 10

Utah State University

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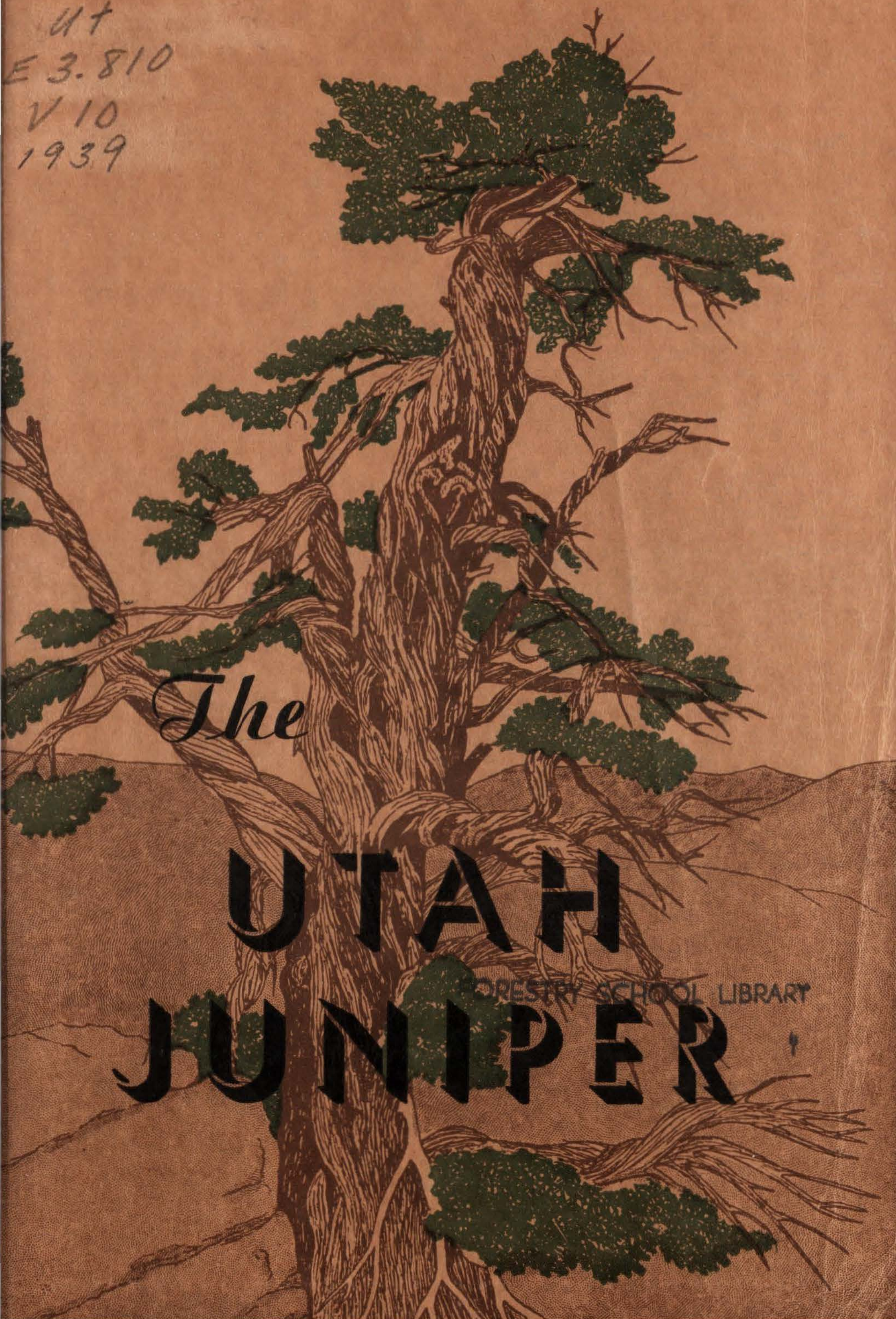
# The UTAH JUNIPER



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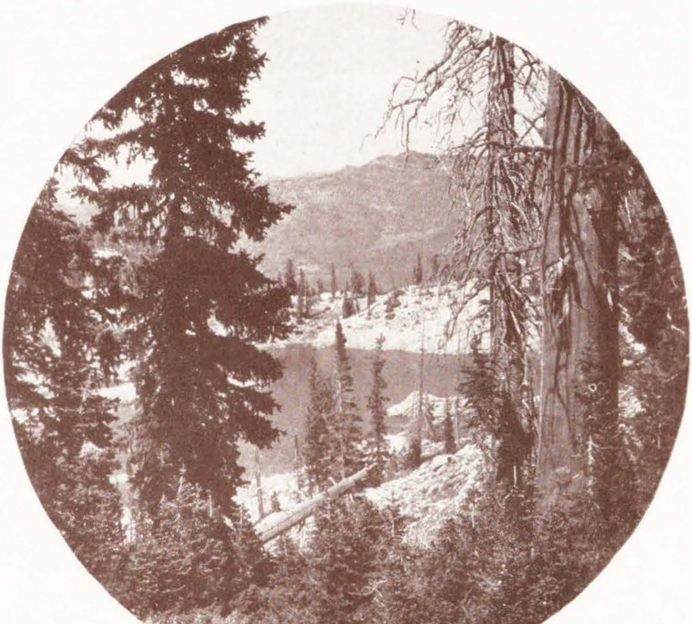
# THE UTAH JUNIPER



*Annual Publication of*

## THE UTAH FORESTERS

UTAH STATE AGRICULTURAL COLLEGE

LOGAN, UTAH

VOLUME 10 1939

(Photo by U. S. Forest Service)

## HOME OF THE GUARDIAN

# Dedication

To these men, guardians of the forest, unhonored and unsung, leading a lonely but useful life, we respectfully dedicate this, the tenth issue of the *Utah Juniper.*

**THE LOOKOUT**

*God little thought, when He skillfully wrought*
*The peaks of this wonderful land,*
*That cabins of wood built solid and good*
*Would be placed on their tops by man.*

*For if He had, He'd have been glad—*
*At least I'm reasonable sure—*
*To have used more care as he put them there*
*The comforts of man to secure.*

*For a high, stone peak is cold and bleak*
*In the time of a raging storm,*
*Or shining bright with all his might*
*The sun makes it mighty warm.*

*Yet there's many a home on a rocky dome*
*Upthrust through the forest land,*
*Where, in hot July when all is dry,*
*A lookout takes his stand.*

*And there he stays, throughout the days,*
*That the sun god reigns supreme;*
*And he keeps an eye on earth and sky*
*To report each smoke that's seen.*

*Oh a lookout's life of lonely strife*
*'Tis rough, but it is good;*
*He lives by himself on a rocky shelf*
*In a penitential mood.*

—James C. Iler

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# FIRE DANGER METER DESIGN

*By* H. T. Gisborne,
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Fire danger meters, boards, charts, or other devices for integrating the factors of fire danger that vary from day to day constitute one of the three essential steps in obtaining an index of the size of forest fire control organization needed at any particular time. These three basic steps have been outlined by the writer in an article, "The Principles of Measuring Forest Fire Danger" without, however, attempting to discuss the various possible methods of integrating the several danger factors. With danger meters, boards, charts and other methods now being evolved for this purpose in practically every forest region of the United States, the outstanding possibilities deserve careful consideration.

No space will be used here describing any indices which comprise only one factor of fire danger and require no integration. There have been many of these such as evaporation rate alone or vapor pressure alone as proposed by Munns in 1921, relative humidity as proposed by Hoffman and Osborne in 1922 and modified by Shank in 1935, duff moisture alone as proposed by Gisborne in 1923, or by Stickel in 1928, or precipitation alone as proposed by Loveridge in 1935. Such single indices may be useful in partially estimating probable fire behavior in a specific fuel type but it is generally recognized today that other factors also have a pronounced effect on the general or total fire danger to be considered in obtaining an index suitable as a guide to the size of the fire control organization.

As illustrated by the danger rating schemes now being developed in Regions One, Two, Five, Six, Seven, Eight, and Nine of the Forest Service and the testing of the Region One method in Region Four, the type of first danger index most urgently needed by fire control administrators is a numerical method to replace the old simple, all-inclusive generalities of "easy, average, bad, darned bad, and (worse expletive) bad." These generalities, necessary in lieu of any more specific rating, were not intended to apply to any particular spot or fuel type, or to any particular hour of the day. They were merely general summations of all the factors of danger, for the day as a whole, and usually for an entire ranger district, often an entire National Forest. The supervisor then built up or reduced his fire control force, usually for the forest as a whole on the basis of this general, average danger as he and his rangers roughly estimated it. From the beginning of organized fire control until the advent of "measured danger" men naturally expressed this generality in words rather than in numbers. Before the invention of thermometers people "got along" with the terms "cold," "cool," "warm" and "hot" but those would hardly be adequate for a technician today.

In this connection it is worth while to repeat a statement by that famous physicist, Lord Kelvin. "When you can measure what you are speaking about and express it in numbers, you know something about it, but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind. It may be the beginning of knowledge but you have scarcely in your thoughts advanced to the stage of a science." Substitution of a numerical scale for word descriptions was, therefore, merely a first step or attempt toward a scientific method of rating fire danger, and the rating first needed was for an entire Forest, a whole ranger district, or at least the general vicinity of a particular station for the day as a whole.

This point, rating general or gross danger, deserves emphasis because recent experience indicates that some men are forgetting this original and essential function of danger ratings. During the past few years in Region One, where field men are now becoming intimately familiar with numerical danger ratings, there have been numerous criticisms voiced that "this" fire in cheatgrass at 4 p.m. burned harder than the danger rating indicated, and that "that" fire in a spruce bog at 4 a.m. did not burn as hard as the rating promised. The voicers of such criticisms obviously forget that they themselves would not man all their fire control stations covering their many fuel types for cheatgrass fires at 4 p.m. alone, or for spruce bog fires at 4 a.m. alone. They also over look the fact that such applications of danger ratings introduce a new factor—fuel type—which is one of the constants rather than one of daily variables of danger. When these facts are considered it is usually concluded that the manning of fire control stations on a ranger district as a whole should be for the general, average behavior of all fires in all fuel types during the worst part, but not the very worst instant, of the day.

The fire danger rating most urgently needed is therefore one which designates numerically the average worst conditions which may be expected and which comprises all the significant factors of danger, not merely one single factor. The most significant are generally the afternoon meteorological conditions. Length of the night is an inescapable factor, however, because the greater the hours of darkness the longer the period of slow fire spread and easy control. If the fire danger index is to represent the general size and difficulty of the fire control job, then that index must rate those days lower which have the most hours of slow burning, other things being equal. That these hours vary significantly is evident from the compilations of "hours of possible sunshine" available for reference at any first-order meteorological station. At Missoula, Montana, for example, there are only 8.1 hours from sunset to sunrise on June 22, but there are 11.8 hours of this cooler, more humid darkness on September 22, and 13.4 such hours on October 22.

Although such facts may seem, at first, to have little or no bearing on danger meter design they are basic to it because the number and kind of factors believed to be significant determine the complexity or simplicity of the meter, board, or charts. If hours of favorable and hours of unfavorable burning conditions are significant, then this factor must be incorporated into the danger meter, board, chart, or table along with fuel moisture or humidity as an index of fuel moisture, wind, lightning, prevalence of man's activity in starting fires, visibility distance, and any other essential conditions. Selection of these factors is, therefore, the first step in danger meter design. However, the more factors selected the more complex the meter will be and simplicity is always desirable.

How the several separate factors of danger are to be integrated into a numerical rating is the second process. If the factor weights are believed to be additive, they can be combined easily without use of any charts or slide rule devices as illustrated by the following examples from the Region Two method:

| Factor | One day | | Another day | |
|---|---|---|---|---|
| | Status | Weight | Status | Weight |
| Wind | 2 mph | + 5% | 25 mph | 35% |
| Temperature | 65° | 0% | 100° | 15% |
| Fuel moisture | 25% | | 3% | |
| One-fourth relative humidity | 15% | | 3% | |
| Total | 40% | + 5% | 6% | 25% |
| Days since last rain | 0 | 0% | 9 | 25% |
| Vegetation | Green | —10% | Cured | 0% |
| Status of fire danger | | 0% | | 100% |

*A Fire Danger Chart*
(Photo Courtesy U. S. Forest Service)

This additive method is now used in Region Two of the Forest Service. It has the marked advantage of simplicity but it is obviously restricted to regions or fuel types where a certain factor, a 25 m.p.h. wind for example, always has the same effect upon fire danger regardless of the status of all the other factors.

Most of the danger rating schemes now in use give much more weight, at one time or another, to a strong wind as the fuels become drier and drier. The California "class of organization index" chart, for example, gives an increase of only half a class in the danger rating if the wind velocity increases to 25 m.p.h. while the fuels are at 20 percent moisture content, but it raises the danger rating more than two classes if the wind changes from calm to 25 m.p.h. whenever the fuel moisture is at 5 percent. The Appalachian station's latest meter for the far eastern United States likewise raises the danger rating only one class for an increase from calm to a 25 m.p.h. wind right after a good rain but jumps the danger three whole classes for this same wind change if it occurs 9 to 15 days after the last good rain. The Region One method recognizes this same principle during the early and late portions of a fire season but during the peak months, July 11 to September 10, the Region One method more nearly follows the Region Two additive scheme. The Lake States meter (1937 model) raises the danger rating for fresh winds hardly any if the humidity is high but as much as three classes if the humidity should be low right after a good rain. Nine or more days after a good rain, and under certain other conditions, the Lake States meter raises the rating by one class if the wind increases from calm to 18 m.p.h. regardless of whether the humidity is high or low. The Pacific Northwest danger board gives no weight to a wind increase if the fuels are wet and vegetation is green, but raises the rating by one class, for an increase from calm to a 15 m.p.h. wind, if either the fuels are dry or the vegetation is cured. All of these systems therefore give more weight to a wind increase under certain conditions and less weight under others. This has not yet been done conveniently by the simple, additive method.

The Pacific Northwest or Region Six "integration tables" constitute another relatively simple method of integrating the fire danger factors selected. By such tables it is easy to obtain first a "burning index" and then what Region Six calls a "class of day index." This is done by using two sets of tables, one for the factors of fire behavior, and another to bring in those factors having no effect on behavior, such as visibility and activity of the causative agencies, but recognized as effective in controlling organization size. Such tables merely list all possible combinations of basic factors, each factor range being divided into groups or classes, each possible combination of all factor groups then being given an index number.

Alignment charts offer another method, of special statistical soundness, for integrating factor measurements into numerical indices. This method has been used successfully by Stickel in the Northeast to integrate those factors affecting fuel moisture into an index of forest inflammability. This index is partially comparable to the "burning index" used in Region Six, but omits wind as a factor of rate of spread of fire. The Northeastern method stops with the derivation of a burning index and does not include visibility distance and activity of the fire-starting agencies—man and lightning. All these probably could be incorporated into alignment charts and the integration and final numerical rating of general, total danger thereby obtained by this method.

Such charts would be very complex but they would have the marked advantage of utilizing small steps in each factor measurement and of producing a final index likewise graduated into small intervals. For example, when the total range of any factor is subdivided into groups, such as 0-3, 4-7, 8-12, 13-18 m.p.h. of wind, for instance, a change from a 3 to a 4, a 7 to an 8, a 12 to a 13, etc., results in a jump rather than a small step in the integration. While everything in Nature is discontinuous, including Time, the discontinuity is usually by such small steps that the process is continuous for practical purposes such as fire control. Fire danger may seem to increase or decrease, at times, by leaps, but the change actually is by very small steps. The ultimate danger meters undoubtedy will break the ratings into the smallest practical or appicable steps and will avoid obvious jumps better than is done at present.

In Region Five simple correlation charts, giving an "index number" for any combination of two factors, are used to obtain three distinct indices—an "ignition index," a "spread index," and an "organization index." The latter is based upon only fuel moisture and wind. Lightning, visibility distance, man's use or presence in the forest, the herbaceous stage, relative humidity, and precipitation are measured or estimated and included on the Region Five fire danger daily record but are not at present included in deriving the class of organization index.

In Regions One, Seven, Eight, and Nine the present meters are designed on the slide rule principle similar to the "Harvey Exposure Meter" used in photography. Circular disks, similar to those employed by the Harold or Wellcome exposure meters also could be used to incorporate an almost unlimited number of fire danger factors. The cost and mechanical difficulties of printing, cutting, centering, and mounting perfect circles is the principal disadvantage in the latter method. By employing the Harvey exposure meter method of construction the meters now used in Regions One, Seven, Eight, and Nine easily include all of the many factors believed to be essential to general danger rating and the devices have the added advantages of pocket size, easy manufacture, and low cost. Incorporation of all significant factors requires two slides for the Northern Rocky Mountain and Lake States meters, but only one for the Central States, Piedmont and Coastal Plain, Southern Appalachian Mountain, and Jemison's newest "for use in the mountainous regions of the eastern United States."

One of the major assets of the pocket-sized meter is its pocket size, which permits men to carry them and refer to them readily. This was a very important factor in the early stages of developing measurements of forest fire danger, when widespread use of the method naturally depended upon widespread discussion and frequent checking under field conditions. This need probably is now decreasing in direct proportion to increased familiarity with the method and the rating scale.

One of the major disadvantages of the pocket-sized meter is lack of space (1) to explain all features fully, and (2) to provide the numerous small steps or graduations of each factor previously mentioned. To explain fully the operation of the meter requires several pages of text for any of the meters now in use, although some are much more self-evident than others. This difficulty is especially great, and the chance of misuse of the method increased, when some factor such as vegetative condition has to be estimated because it cannot be measured. To provide small steps, daily gradations of danger from May 1 to October 31, on the Region One meter, would require a device probably five times the size of the present device. Under present practices of fire control the refinement attainable by graduating by days, by single percents of fuel moisture, or by single miles of wind are unwarranted, however, and portability or compactness of the meter design is still believed to be the more important feature.

Only one experiment station has as yet given marked emphasis to the display or public interest value in danger meters. The Pacific Northwest Experiment Station has done this by development of their "danger board," a wood panel measuring 18x24 inches and weighing about 14 pounds. Nine windows in the face of the board show the month, day, fuel moisture, relative humidity, wind velocity, herbaceous stage, visibility, risk, and class of day, the factor measurements being numbered and additionally indicated in color. White or green is used for most favorable conditions, and then blue, yellow, orange, and red as the factor or class becomes more dangerous. Convenient brass knobs permit turning up the proper color and class number. The two small integration tables to determine "burning index" and "class of day," previously mentioned, are mounted on the face of the board for convenient reference. The device is eye-catching and attracts attention, but for public information this device is like all the others; it requires a booklet or an announcer to explain it. In many places, however, especially on the National Parks where announcers are part of the work, this display or public interest feature of danger meter design undoubtedly deserves careful consideration.

All of the integrating charts, tables, meters, and boards so far designed do no more than rate the danger for one day at a time. None of them serve to show that highly significant feature, the trend of danger; whether level, upward, or downward. Separate charts apparently are necessary for this purpose although it might be possible to print on one side of one of the slides in a meter a blank chart for recording, say, class of danger and percentage of organization on duty, by days. A new slide, and chart, could be furnished all meter owners each year.

One new feature introduced by the meter for the mountains of the eastern United States is the incorporation of descriptions of the four major types of general weather forecasts—precipitation, unsettled, partly cloudy, and fair, together with predicted wind velocity by the standard terminology. By setting this meter for date, number of days since last rain, the wind prediction, and the general weather forecast, a danger rating for tomorrow is obtainable. Obviously, a large part of the dependability of such a danger rating is based upon the accuracy of the weather prediction. For the eastern mountainous regions these predictions have been found sufficiently dependable to justify this new feature in danger meter design.

These many features of design and method of integrating fire danger factors constitute a complexity that is not readily solved. To date some sacrifices, or at least compromises, have been made in every method in use. It is highly desirable that the various possibilities be studied carefully in all regions because eventually there will almost certainly be need for a nationwide danger rating scheme, with a meter, board, or chart that can be used on danger factor measurements from any region to give danger ratings comparable between regions.

## THE ROLE OF CHEMICALS IN FIREBREAK MAINTENANCE

*By* H. D. Bruce

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*Berkeley, California*

### *The Problem of Firebreak Maintenance*

In the state of California there are over 3400 miles of firebreaks. This extensive system constitutes an important part of the forest fire control facilities which have been developed by county, state, and federal agencies over the past 30 years.

Of this system of firebreaks nearly 2700 miles are in southern California where breaks of from 40 to 100 feet in width are located on most of the main divide ridges and on laterals between important sub-drainages. The cover in this southern country is chaparral, inflammable in the dry season, dense and resistant to fire line construction, yet important as watershed protection to the great property values in the lowlands.

In northern California there are about 700 miles of firebreak consisting for the most part of "Ponderosa Way," that great break, 50 to 150 feet wide, running for 600 miles down the western side of the Sierra Nevada Mountains between the woodland type on the lower side and the conifer type above. The Ponderosa Way was initiated in 1933 as an Emergency Conservation Work project. Low bushy vegetation was cut away, snags and fallen logs were removed, trees were thinned, and lower limbs of all trees left standing were removed to a height of 8-10 feet. The purpose of this great broad firebreak is to aid in restraining fire starting in the woodland type of the foothills from raging up and into the commercial stands of pine timber of the higher elevations.

The California firebreak system represents an investment of nearly $3,000,000. To protect this investment these firebreaks must be maintained by successive clearing operations at intervals of from one to three years. Tractors and scrapers can be used on about half of the breaks, but the other half must be cleared by hand labor. Such maintenance requires the annual expenditure of approximately $100,000.

In view of the expense of maintaining firebreaks it is pertinent to inquire into the uses to which they are put in order to gain a better understanding as to how maintenance might be more profitably managed. Mr. Geo. H. Cecil in his firebreak study of 1937 classified the various actual uses as follows:

| | *Percent* |
|---|---|
| Backfiring | 15.5 |
| Holding stringers | 16.5 |
| Tying in slopovers | 18.0 |
| Controlling spot fires | 16.5 |
| Stopping fires | 11.5 |
| Slowing down fires | 22.0 |

From these figures we see that, for the automatic stopping of fires, breaks have been of only minor importance. Those occasions when the fire did stop at a break were probably in the damp of the night when the wind was down and progress was slow or when the fire approached the break against the wind. Not cited with the six uses above is the one of greatest importance in fire suppression, namely, the safe moving of men. The firebreak permits entrance to a burning area by a suppression crew in comparative safety and assures an exit in cases of emergency. The firebreak must be considered not as a positive barrier to flame but as a line at which a fire suppression crew can take its stand.

One of the principal purposes for which the breaks were originally constructed was that of backfiring. We note, nevertheless, that they have served this purpose only to a limited extent. Backfiring is sometimes inadvisable because of high winds prevailing at the time but more often is frustrated by the impossibility of manning them in sufficient time at sufficient strength. In order to backfire, a crew must arrive on the ridge well ahead of the flame front, prepare with shovels or McLeod tools a narrow line lengthwise of the break down to mineral soil, backfire from that line, and watch the fire thus set for slopovers and spotting. The preparation of that backfiring line is a time-consuming burden and comes at a time when minutes are at a premium. Furthermore, the prevention of spot fires often requires considerable man power, particularly if the break has not been maintained quite free from such fire-hazardous species as manzanita, Ceanothus, and particularly live oak. Such circumstances limit the opportune and strategic use of backfiring as a suppression measure.

Chaparral live oak in California is a big fire hazard problem. These species sprout copiously from the root and cannot be killed by desprouting. Grubbing is slow and costly; blasting is costly and uncertain. Other common undesirable sprouting species are green manzanita, whitethorn, toyon, sugar-bush, and mountain mahogany. From 2000 to 3000 stumps per mile of firebreak are not uncommon. From such over-growth of sprouting stumps firebreaks must be maintained.

In the central part of the state the low-growing, perennial shrub, bear clover (*Chamaebatia foliolosa*), is found in dense stands on the north slopes. Its high inflammability and vigorous capacity to sprout make it a serious handicap to the fire fighter.

After a break has been cleared of brush and trees in the initial construction, there succeeds a heavy growth of native grasses, wild oats, and other annuals, which become dry and inflammable during the summer months in California. It is through such cover that backfiring lines must be hurriedly cut and spot fires extinguished.

For several years the U. S. Forest Service has been investigating the possible application of chemicals to the three main aspects of this problem of firebreak maintenance and utilization: (1) the killing of sprouting stumps, (2) the killing of dense perennial shrubs like bear clover, and (3) the sterilization of soil against annual vegetation.

### *Stump Poisoning*

The stump poisoning experiments consisted in treating individual stumps with varying quantities of several chemicals at all seasons of the year and in different localities representing different soils and climatic conditions. In all over 2,500 stumps have been treated, each being tagged with a numbered metal disc for subsequent identification and inspection. Very briefly, the treatment consists in cutting off the sprouts from the stump, hacking the crowns at and just below ground level, and spraying with the chemical solution. The hacking through the bark is quite the most important step in the whole operation; unless it is thorough, the result will be unsatisfactory. In table 1 is presented a summary of results from the stump poisoning experiments, showing the percentage killed irrespective of all conditions other than the chemical employed.

TABLE 1—*Percentage of sprouting stumps killed by specified chemical.*

| Chemical | Percentage killed |
|---|---|
| Sodium chlorate, 10 percent solution | 92 |
| Sulfuric and arsenic acid (1:1) 25 percent solution | 90 |
| 27° API Diesel oil | 88 |
| 1:4 Petroleum aromatic extract in 24+ fuel oil | 86 |
| Acid sodium arsenite solution | 83 |
| Ammonium thiocyanate, 25 percent solution | 82 |
| Arsenic acid, 20 percent solution | 78 |
| Tri-sodium arsenite, 25 percent solution | 75 |
| Sodium chloride, 15-50 pounds per stump | 65 |
| Chlorinated lime | 50 |
| Sodium hypochlorite, 5 percent solution | 50 |
| 1:2 Creosote in 24+ furnace oil | 50 |
| Pyridine | 50 |
| 24° + Furnace oil (28° .8 API) | 44 |
| 32° .8 API Diesel oil | 20 |
| Sulfuric acid, 25 percent solution | 11 |
| Copper nails, driven into crown | 0 |
| Copper sulfate, 25 percent solution | 0 |
| Ferrous sulfate, 25 percent solution | 0 |
| Dinitrocresol, 4 percent aqueous solution | 0 |
| Carbon bisulfide | 0 |

The figures are for single, not repeated, application. The sprouts which develop from stumps not killed by the more potent chemicals are invariably so few in number and so localized that they are easily killed by a second application. Therefore, the true effectiveness actually exceeds the figures shown in table 1.

The acid sodium arsenite tested as a stump poison was essentially (1:1) $NaH_2AsO_3 + H_3AsO_3$, made by dissolving arsenic trioxide in sodium hydroxide solution. It is effective down to 1.5 percent concentration. It is the cheapest potent poison listed in table 1. It is not recommended for general use, however, because of its extreme toxicity to men and animals. It has a soda-like odor and a salty taste and is both attractive and poisonous to grazing stock. Stumps so treated must afterwards be covered with earth to conceal the poison.

Of all the chemicals found highly effective on sprouting stumps Diesel oil is the easiest to use. It is dangerous neither to workmen nor to grazing animals. Its one serious defect lies in the great variance in toxicity of the several grades, as attested by 88 percent effectiveness for the 27° grade but only 20 percent for a 32° .8 grade. According to our present information the gravity should not be higher than 29° API for satisfactory stump poisoning. This 27-29° grade, however, is at present off the Pacific coast market as a regular stock product as the result of recent improvement of Diesel oils for transportation purposes by the major petroleum refiners. The increase in effectiveness of furnace oil from 44 percent to 86 percent, by the addition of 25 percent of "aromatics," indicates that the aromatic and double-bonded compounds are the toxic ingredients of petroleum oils.

Sodium chlorate in 10 percent aqueous solution is now being recommended for use in killing undesirable stumps on forest firebreaks. The advantages of chlorate are its relatively low poison hazard to men and animals, its high herbicidal effectiveness, and the simplicity of its use. Its disadvantages are its moderately high cost (9-10 cents per pound) and the fact that under certain circumstances it has been known to incite spontaneous ignition. Proper application of 10 percent sodium chlorate may be relied upon to kill in one application over 90 percent of the stumps treated therewith and practically 100 percent in a second follow-up treatment.

### *Soil Sterilization*

Experimentation on chemical sterilization of soil was carried out with the idea that, if an economical and adequate method of soil sterilization should be developed, it would find application in preventing plant growth on a narrow strip of soil to be used as a backfiring lane down the center or along both edges of the firebreak.

Tables 2 and 3 summarize the results of using certain chemicals in sterilizing soil against grasses and bear clover, typical, respectively, of shallow rooted annuals and deep rooted perennials. The effects were judged by visual observation and estimation of the proportion of full stand kept from growing by the presence of chemical in the soil, in comparison with adjacent untreated plots. They present averages of several similar plots located in different parts of the Sierra Nevada and Sierra Madre foothill country.

TABLE 2—*Soil-sterilization effect of various chemicals against grasses.*

| Chemical | After season | Pounds per square rod | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 6 | 9 | 12 |
| Sodium chlorate | 1st | 30 | 60 | 70 | 80 | 90 | 95 | 100 |
| | 2nd | 0 | 20 | 30 | 40 | 80 | 85 | 100 |
| | 3rd | 0 | 0 | 10 | 15 | 20 | 40 | 50 |
| | 4th | 0 | 0 | 0 | 0 | 5 | 20 | 30 |
| | 5th | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Sodium arsenite | 1st | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | 2nd | 97 | 98 | 98 | 98 | 99 | 100 | 100 |
| | 3rd | 95 | 96 | 96 | 96 | 99 | 100 | 100 |
| | 4th | 86 | 90 | 91 | 93 | 99 | 100 | 100 |
| | 5th | 60 | 70 | 80 | 90 | 98 | 100 | 100 |
| Arsenic trioxide | 1st | 10 | 25 | 40 | 65 | 85 | 95 | 99 |
| | 2nd | 80 | 95 | 99 | 99 | 99 | 99 | 99 |
| | 3rd | 25 | 60 | 85 | 99 | 99 | 99 | 99 |
| | 4th | .... | .... | .... | 98 | 98 | 99 | 99 |
| | 5th | .... | .... | .... | 98 | 98 | 99 | 99 |
| Borax | 1st | 70 | 80 | 80 | 85 | 85 | 90 | 95 |
| | 2nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TABLE 3—*Killing effect on bear clover of certain chemicals applied to soil.*

| Chemical | After season | Pounds per square rod | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 6 | 9 | 12 |
| Sodium chlorate | 1st | 62 | 96 | 99 | 100 | 100 | 100 | 100 |
| | 2nd | 59 | 94 | 99 | 99 | 100 | 100 | 100 |
| | 3rd | 55 | 88 | 99 | 99 | 100 | 100 | 100 |
| | 4th | 48 | 82 | 98 | 98 | 99 | 100 | 100 |
| | 5th | 35 | 72 | 96 | 97 | 98 | 99 | 100 |
| Sodium arsenite | 1st | 30 | 54 | 72 | 83 | 93 | 94 | 99 |
| | 2nd | 28 | 49 | 65 | 78 | 91 | 93 | 99 |
| | 3rd | 22 | 43 | 58 | 72 | 86 | 91 | 99 |
| | 4th | 16 | 36 | 48 | 62 | 80 | 86 | 98 |
| | 5th | 8 | 25 | 35 | 48 | 69 | 78 | 97 |
| Arsenic trioxide | 1st | 0 | 0 | 0 | 0 | 5 | 10 | 15 |
| | 2nd | 0 | 0 | 0 | 0 | 5 | 12 | 15 |
| | 3rd | 0 | 0 | 0 | 0 | 3 | 7 | 7 |
| | 4th | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Borax | 1st | 5 | 30 | 50 | 70 | 90 | 94 | 100 |
| | 2nd | 0 | 25 | 45 | 65 | 88 | 93 | 99 |
| | 3rd | 0 | 20 | 40 | 60 | 85 | 92 | 99 |
| | 4th | 0 | 10 | 30 | 50 | 80 | 88 | 99 |

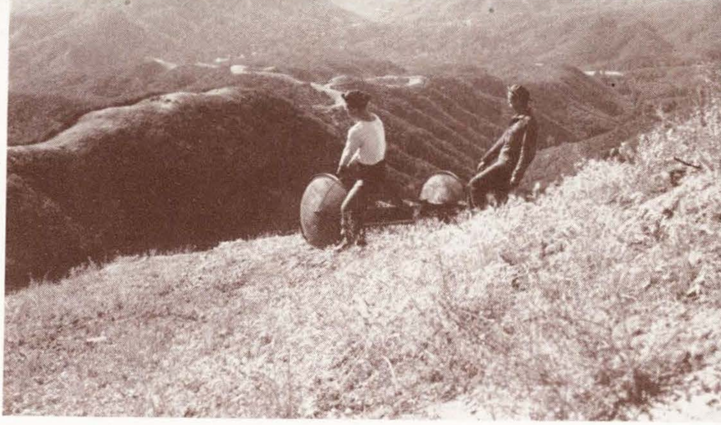

*Figure 1—Distributing arsenic trioxide to sterilize a backfiring lane along a forest firebreak.*

In table 2 it may be seen that sodium chlorate has little effect in keeping down the growth of grasses unless rather large spreading rates, 9 or more pounds per square rod, be used. Even at that, the effect rapidly disappears and is gone by the third season.

In contrast to the chlorate, sodium arsenite is effective against grasses in amounts as low as 2 and 3 pounds per square rod and its effectiveness decreases only slowly during subsequent seasons.

Arsenic trioxide is very effective against grasses but its full potency is developed slowly and not reached until the second season. On the other hand recent evidence indicates that the life of the sterility produced by arsenic trioxide may be considerably longer than that due to sodium arsenite.

Borax had little apparent effect on the grasses. It seemed neither to hinder nor to accelerate their growth after the first season.

From table 3, we find quite different effects of the various chemicals upon bear clover. Sodium chlorate is seen to be much more effective than it was against grasses. Four pounds or more per square rod comes near to complete eradication.

Sodium arsenite applied to the soil surface is not the deterrent to bear clover that it was for grass. Twelve or more pounds per square rod do fatally poison this species but such applications are relatively heavy.

For practical purposes, arsenic trioxide has no influence on bear clover. This is in marked contrast to its action on grass.

Borax is deleterious to bear clover but at least 12 pounds per square rod is required for a complete kill. This is not a poor showing considering the low cost of borax and the fact that it contains about 46 percent water of crystallization.

These results are easily understood when the chemical behaviors of the compounds in the soil are considered. When soluble arsenites are sprayed upon the ground, they rapidly become "fixed" by colloidal adsorption so that they remain in the thin top layer of the ground. Consequently, arsenites are admirably suited for killing grass roots and for preventing the sprouting of seeds. As little as 3 to 4 pounds of sodium arsenite per square rod rendered the soil practically free from grassy growth for many years. Deep roots, like those of bear clover, on the contrary, are below the arsenic poisoned layer and survive uninjured.

Chlorates are very soluble compounds and are not precipitated or strongly adsorbed by the colloidal constituents of the soil. Consequently, they penetrate the soil freely, reaching and killing the deep roots of perennial plants, but, for the same reason, they are easily leached from the top soil and are not long present to deter the growth of grasses and shallow-rooted weeds.

Borax is a sodium salt of a divalent ion. It is not strongly adsorbed by the soil colloids, but remains largely soluble and is gradually leached away by rainfall. As would be expected, it is much like sodium chlorate in its action, although not as toxic. The calcium borates are much less soluble than the sodium salts, and, tested in the form of Colemanite ore, have been found to stay in the top soil stratum in sufficient concentration to keep grass from thriving for three or four years.

The use of toxic chemicals necessitates a few strict precautions. Sodium arsenite is not only extremely poisonous to animals, but it is moreover attractive to them. Experience leads to the conclusion that widespread use of sodium arsenite in any grazing area will inevitably result in the death of some cattle.

The white arsenic trioxide is also poisonous, but does not have the attractiveness of the alkali salts. If white arsenic be spread upon the grass which is later consumed by cattle, fatalities may result. In our use of this compound, the cover is first removed, then the chemical is spread upon mineral soil. In this way white arsenic has been spread through cow pastures and deer refuges without ill effects.

Workmen using dry white arsenic must avoid breathing the dust and prevent its collecting beneath the finger nails. During the working period all dust should be frequently washed from the hands and face, lest arsenical skin sores develop.

Chlorates do not have the extreme toxicity of arsenic to animals, but they do have one serious fault, the tendency to promote spontaneous

*Figure 2 — A firebreak backfiring lane several years after sterilization with arsenic trioxide.*

(Photo by H. B. Bruce, courtesy California Forest and Range Experiment Station U. S. Forest Service.)

ignition. The condition under which this is apt to happen is apparently an intimate mixture of the chlorate with finely divided, acid, rotting, organic matter. Strong sunlight undoubtedly exerts an accelerating influence on the oxidation reaction. Above all, workmen must not allow chlorate solution to dry upon their clothing.

Figure 1 shows Civilian Conservation Corps workmen using a mechanical applicator to distribute white arsenic on the crest of a firebreak through chaparral country. The strip being treated should subsequently, barring serious erosion, look like the close-up view shown in figure 2 of a strip similarly treated, which, after three years, is quite barren except for an occasional plant which has managed to gain a foothold.

A 5-foot lane like that shown in figure 2 would serve for backfiring purposes without initial treatment. The cost of chemicals for such a job is about $13.00 a mile; of labor from $3.00 to $18.00 a mile, depending on the terrain and amount of manual labor. The economic justification of these costs involves the life of the sterilization. Our earliest soil sterilization plots are now about 5 years old. These plots on which four or more pounds of arsenic trioxide was used to the square rod are still practically free of annual vegetation. Just how long arsenic sterilization will persist can not be definitely stated. The duration largely depends on such chance factors as wind and water erosion, treading by animals, and burrowing by ground squirrels, as well as chemical fixation and leaching by rain water. In the light sandy soils of the Sierra Nevadas the effective life is longer than in the heavy valley loams and clays. In forest regions erosion by intense rainfall is the most serious single factor tending to destroy soil sterilization by arsenic. Wherever a path is sterilized on sloping ground, possible erosion should be foreseen and small run-off diversion dips installed.

In brief summary, successful use of firebreaks necessitates maintenance, both costly and laborious, but which can be facilitated by the proper use of chemicals. Firebreaks can be cleared of sprouting stumps by the application of chlorate to the root crown. This reduces the vegetative cover to annuals and small perennials and the immediate fire problem on the break itself to the control of ground fires. With white arsenic trioxide on annual vegetation (sodium chlorate plus white arsenic on bear clover) the soil may remain sufficiently sterile for from 5 to 10 years to serve the purposes of backfiring without need of preliminary clearing.

The advantages of eradicating stumps with chemicals has been repeatedly proven. Soil-sterilization with chemicals has passed the experimental and demonstrational stages but has yet to be adopted on a wide scale. Nevertheless, there are many instances in forestry practice, on roadsides, smoking areas, campgrounds, lookout stations, and others, as well as on firebreaks, where soil sterilization is certain to find economical and extensive employment and to contribute to more successful and systematic combat by the forester of future threats from forest fire.

## RECENT FIRE CONTROL DEVELOPMENTS

*By* T. H. Van Meter
*Forest Service, Ogden, Utah*

Brrrrr-- Brrrrr--

"Dispatcher speaking."

"Big Baldy reporting light blue smoke at azimuth 241, located on south slope near base of Sheep Hill. Smoke drifting northeast. Estimated size less than one-tenth acre. Spreading moderately fast."

And so a typical first report of the existence of a forest fire starts the unwinding of an intricate organization planned for the protection of over 30 million acres of public lands in the Intermountain Region.[1] These lands are under the administration of the Forest Service of the United States Department of Agriculture.

The many problems of fire control in this Region vary with localities to such an extent that administrative units have been classified with regard to their need for protection into broad hazard groups, namely: high, medium and low. The grouping is general and is based upon experiences with fire and its behavior in the various units during the past 30 years. Strangely enough, since large and disastrous fires have occurred in each of the hazard groups, the character of the fuel available to burn does not determine the hazard classification. Practically all the area protected from fire is covered with fuels of various types and kinds and given the proper weather conditions, plus the spark to ignite it, each type will burn with approximately the same intensity and severity. There are, however, certain characteristics of the various units which make it possible to segregate them one from the other.

High hazard areas are characterized by little or no summer rainfall, prevailing low summer humidities, relatively high afternoon winds, high fire occurrence and relatively high temperatures, a normal combination of which usually results in a bad fire situation during the months of July, August, and September. Forest Service administrative units included in this group are the Boise, Challis, Idaho, Payette, Salmon, Sawtooth, and Weiser National Forests. These units are located in a relatively compact group in southern Idaho south of the Salmon River and west of the Lost River.

Areas characterized by occasional summer rains, moderate relative humidities, medium to high afternoon winds, medium fire occurrence and medium summer temperatures, a normal combination of which results in a relatively less acute fire situation than exists in the high hazard group, are considered as medium hazard in character. In certain years, however, due principally to unfavorable weather conditions, high danger does exist in this group. Although fires occur during all months of the summer season it is only during late June, early July, late September, and early October that fires have burned over large areas and have caused considerable damage in what would otherwise

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[1]The Intermountain Region includes southern Idaho, southwestern Wyoming, Utah and Nevada, excepting the extreme southwest portion, and has been designated as Region 4 by the Forest Service.

be termed a normal fire season for the group. A high hazard condition for a limited period may be expected in this group in 8 years out of 10. In the two exceptional years when weather conditions approach those existing in the high hazard group, large fires may be expected and do occur during all of the summer months. Administrative units included in this group are the Ashley, Cache, Targhee, Teton, Wasatch, and Wyoming National Forests. These units are located in southeastern Idaho, southwestern Wyoming, and northern Utah.

The low hazard areas are characterized by numerous summer rains, relatively high humidities, low to medium afternoon winds, low fire occurrence and medium to high summer temperatures. A normal combination of these factors results in a considerably less severe fire situation than usually exists in the medium and high hazard groups. In certain parts of the group there occur large grass and oak brush areas. When the grass matures and the oaks drop their leaves in the fall a highly inflammable fuel is deposited on the ground and if fire becomes ignited in either of these types before fall rains dampen the fuels, a large burned acreage may be expected. The low hazard group includes the Caribou, Dixie, Fishlake, Humboldt, La Sal, Manti, Minidoka, Nevada, Powell, Toiyabe, and Uinta National Forests. These administrative units are located in southern Idaho near the Utah line, southern Utah, and Nevada.

A study of fire occurrence indicates clearly the differences in the fire control activity in each of the above hazard groups (table 1).

The large number of man-caused fires compared to the number of lightning-caused fires occurring in the low hazard group as contrasted to the high hazard group raises a question concerning lightning storms and the number of fires developing therefrom. Storms of similar intensity occur over all parts of the Intermountain Region at various

TABLE 1—*The occurrence of lightning-caused and man-caused fires on national forest protection areas within the Intermountain Region.*

| Years | High Hazard Areas | | | Medium Hazard Areas | | | Low Hazard Areas | | |
|---|---|---|---|---|---|---|---|---|---|
| | Caused by: | | Total | Caused by: | | Total | Caused by: | | Total |
| | Lightning | Man | | Lightning | Man | | Lightning | Man | |
| 1929 | 196 | 166 | 362 | 29 | 38 | 67 | 39 | 44 | 83 |
| 1930 | 256 | 131 | 387 | 16 | 56 | 72 | 16 | 32 | 48 |
| 1931 | 213 | 267 | 480 | 81 | 362 | 443 | 33 | 144 | 177 |
| 1932 | 116 | 134 | 250 | 23 | 85 | 108 | 13 | 33 | 46 |
| 1933 | 86 | 183 | 269 | 26 | 166 | 192 | 25 | 83 | 108 |
| 1934 | 295 | 180 | 475 | 84 | 209 | 293 | 39 | 99 | 138 |
| 1935 | 245 | 198 | 443 | 57 | 170 | 227 | 35 | 70 | 105 |
| 1936 | 409 | 220 | 629 | 49 | 111 | 160 | 41 | 46 | 87 |
| 1937 | 396 | 176 | 572 | 85 | 104 | 189 | 59 | 59 | 118 |
| 1938 | 276 | 87 | 363 | 44 | 107 | 151 | 28 | 70 | 98 |
| TOTAL | 2488 | 1742 | 4230 | 494 | 1408 | 1902 | 328 | 680 | 1008 |
| PERCENT | 59 | 41 | 100 | 26 | 74 | 100 | 33 | 67 | 100 |

*A marine fire pump cargoed for movement to the fire line.*
(Photo by U. S. Forest Service)

times during the summer season but for some unaccountable reason relatively few fires result from them in Utah and Nevada.

Fire prevention, presuppression, and suppression activities properly correlated with the other uses of the unit—such as grazing, timber production, mining, and recreation—constitute the fire control job in each of the hazard groups. The fire work in each group is largely similar and differs only with the intensity of the application of control measures. For example, the technique applied to the control of a small fire is about the same on a low hazard forest in Nevada as it is on a high hazard forest in Idaho. Since the occurrence of fires is less in Nevada than in Idaho, fewer units of work will be required in the former than in the latter to give adequate protection to areas of similar size; therefore, there is great variation in the manpower needed for fire control purposes on the various administrative units.

Much has been done during the past decade in the development of fire control practices in this Region. Through the close cooperation with and education of the users of the national forest areas a material reduction in man-caused fires has resulted. More efficient tools and equipment have been deveoped so that more men can control fires with a minimum amount of fatigue. Successful experiments in the use of chemicals for combating small fires have been conducted during the past few years. Additional roads and trails have been constructed so that fires may be reached more quickly. Airplane service has been developed whereby supplies and equipment may be delivered rapidly to crews on the fire line, thus making it possibe to subsist them more readily in inaccessible places. Plans for training men engaged in fire control have been revised and applied to the extent that more efficient work is performed. Policies and good practices have been recorded so that the beginners in the art of fire control may have the benefit of past experience. Communication developments including refinement of the telephone and short wave radio have brought about closer relationships in fire control activities. Man-placement plans have been revised so that trained men are located at strategic points to discover, reach and attack fires in the least possible time after their origination.

One of the outstanding recent developments has been the modification of the plan of attack in the control of a small fire. Investigations disclosed the fact that a great many of the large fires occurring in recent years have become large because "we had a line around it but a gust of wind came along and spread our fire everywhere." An analysis to determine the best practices to be followed in order to prevent, if possible, recurrence of such situations indicated that smokechasers had usually been content to take a "rest" on the fire line after a "trench" had been constructed around the burning area.

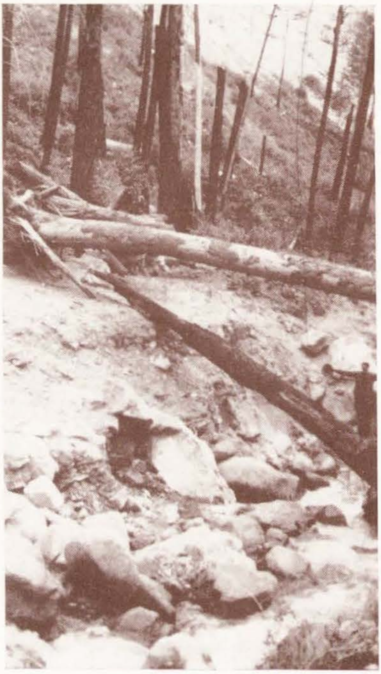
Today, such a practice would be condemned since the present consensus of experienced fire fighters is that the smokechaser should never lessen his efforts in the control of a fire until all of the burning material has been safey disposed of to the extent that the wind cannot spread the fire should it come up unexpectedly. Such a method of control involves the detailed training of a smokechaser in the characteristics of fire, that is, the manner in which the various fuels burn under different conditions; the point of attack, which should be the most crucial point; direct method of attack, which involves the cooling down of the hot spots with dirt or water and the breaking up of the piles of burning debris which may be potential spark throwers, to the extent that all flames are smothered as rapidly as possible and the spread of the fire is stopped; and, finally, mop-up—which consists of mixing dirt with hot sparks and coals, examining each piece of small fuel for active fire and extinguishing the last spark. Fire fighters call it "planting a garden." Fire managers in this Region have found that through the use of this revised method the number of small fires that "get away" from smokechasers has been materially reduced.

Many problems have been considered and solved during the past 30-odd years of protection activities in this region, nevertheless, many more problems are constantly appearing to harass the fire manager and demand his attention for solution so that adequate fire control may be maintained. Some of the pressing questions before the Region at the present time in need of solution are:

1. Reduction of man-caused fires. Although statistics for the past 10 years (table 1) show that man-caused fires occurring within the admiinstrative units have been decreasing in number, there are still too many fires of this nature. Fire managers are, to a large degree, able to predict the occurrence of lightning storms and to make plans for the control of such fires as may result. Since they are not able to predict the whim of human frailty which causes people to start fires, they are seriously searching for effective measures which may be applied to eliminate man-made fires and their resultant damage.

2. Development of a danger meter for the low and medium hazard groups. Fire managers of these groups are seriously handicapped because of the nonexistence of a reliable means of translating existing weather phenomena into terms of fire behavior. Studies are progressing and it is hoped that a method will be

*A portable short wave radio in operation.*
(Photo by U. S. Forest Service)



*Erosion following a fire on the Idaho National Forest.*

created whereby the approach of dangerous fire conditions may be recognized and protection measures applied in time to eliminate the occurrence of disastrous fires.

3. Improved fire protection on hazardous watershed areas. Fire, by destroying the normal plant and soil mantle either permanently or temporarily, induces accelerated erosion and abnormally rapid run-off. The seriousness of watershed impairment by fire varies in accordance with the timber, forage, wildlife, and recreational values consumed by the flames and with the dependence of downstream areas upon usable water supplies. Much more information is needed concerning the influence of fire on downstream values as a basis for planning adequate fire protection for critical watershed areas.

4. Proper organization of men on large fires to prevent loss of life. The fear that some person may lose his life while assisting in the control of fire always confronts the men responsible. Additional training, experience, and more complete plans are some of the measures which may need further development and application.

The record of accomplishments in the Intermountain Region has not been the work of one or a few individuals but has been the result of the unified efforts of the entire Forest Service organization working in close cooperation with the city, county and state officials, schools, organizations and the public generally. Future achievements can be obtained only through the continuance of the combined cooperation and support of all the people.

## WIRELESS COMMUNICATION AS A FACTOR IN FIRE CONTROL

*By* Lloyd J. Astle

Wireless communication is a relatively new element in fire control on the national forests. Its value may, for convenience, be divided into three classes. First, fire prevention; second, fire suppression; and third, criminal prosecution in cases of man caused fires.

It is general knowledge that the radio system of today has been and is still being used in fire prevention programs, and although its value in that field may be questioned, its avenue of action is so obvious that further discussion here will be unnecessary.

For convenience let us divide the field of suppression into the time-worn classes which I assume are already well planted in the minds of all students of forestry. They are: first, discovery; second, report; third, travel; and fourth, extinguishing the fire. In all of these classes time is an important and, with very few exceptions, the major factor.

The value of wireless communication in this field lies in the fact that it can be made portable.

Until recent years poorly placed lookout points have often been used in the place of better ones because of the difficulty, both physical and financial, involved in establishing communications to the better lookout possibilities. The use of radios has eliminated this problem because communication with all desirable points is assured at reasonable cost.

Another factor in which portable communication plays an important part is in keeping a discovery system up to date. A lookout station with a large seen area does not necessarily make a good discovery point. A lookout of high value for an extensive discovery system may prove practically worthless for an intensive discovery system. Also changes in public use of recreational areas vary with improvement or abandonment of transportation systems and thus the fire danger may be decreased or increased on a given forest area. For example: the placing of an improved arterial highway along the Salmon river is creating an ever increasing roadside hazard as the highway approaches completion. Due to this and other important factors, one lookout on the Challis Forest has been abandoned and replaced by a lookout near the roadside hazard strips.

In view of these facts, a worthwhile objective is to devise a system of communication that will materially limit the fixed investment in lookouts which may be abandoned or established when the intensity of protection is varied.

The value of a detection system lies largely in the proficiency with which a report reaches the suppression forces. Furthermore the report should, with few exceptions, be transmitted to that portion of a suppression organization that can arrive at the point of action with a minimum "elapsed time" interval. This means that communication with all field forces is a veritable necessity.

To establish communication with all field forces with a reasonable financial output, wireless communication must be used. Frequent necessary transfer of headquarters by trail crews, administrative officers on duty in the field, and etc., make the use of metallic communication systems, in most cases, impossible. However, frequent setting up of portable communication systems by these field forces is an absolute practicability. For example: A ranger on a high hazard district of an Idaho forest, carried a portable transceiver (radio) during the 1938 fire season. He estimates that a set can be removed from a pack, placed in operation with satisfactory results, and repacked ready for travel within a maximum time of ten minutes.

Satisfactory contact with the closest suppression force often materially reduces travel time. For example: A trail crew on the Challis Forest during the (1938) season just past, had received instructions to contact the fire dispatcher at regular intervals during the rapid burning period. A fire was reported by a lookout shortly after one of these reports. The dispatcher, realizing that contact with the trail crew would not be possible for approximately ninety minutes, dispatched men from a more distant point. When the trail crew was contacted again, these men were also sent to the fire, taking their communication system with them. The fire was reported under control by the trail crew before the men who were first dispatched arrived at the fire. This in no way was due to lack of efficiency on the part of the first crew, but was definitely attributable to the placement of a communication system with the field force.

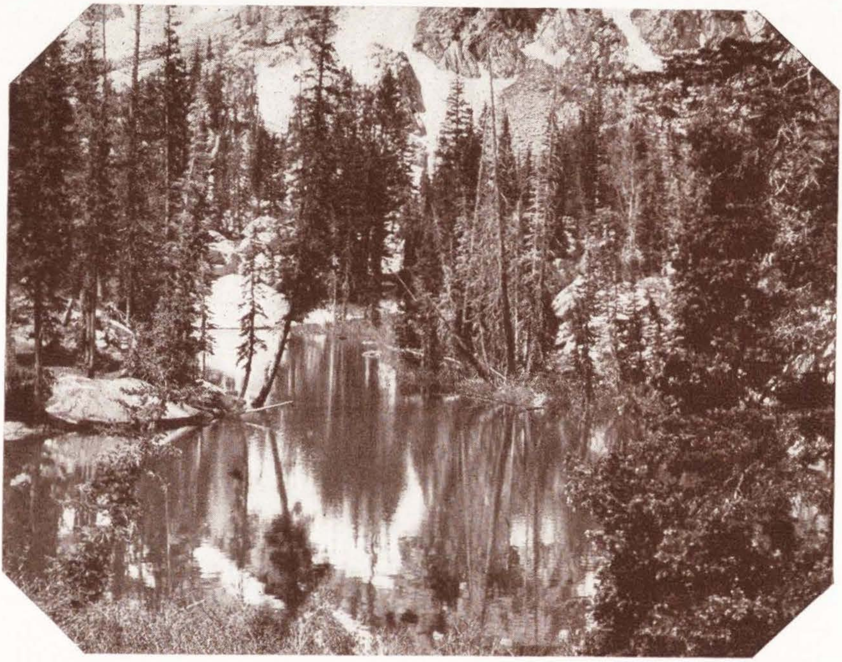
When a fire does not require a second line defense, it is well that the dispatcher or other responsible parties receive information to this effect at the earliest possible instant in order that the disrupting of the control organization may be reduced to a minimum, and unnecessary expense eliminated.

On the other hand if a fire does need a second line defense, information from the fire is more reliable than reports from nearby lookout stations, and communication should be established at the earliest possible moment. Communication, when practical, should be included with the first line defense, and should always be included with the first reinforcements.

In the majority of cases, wireless communication is the more practical if not the only solution to this problem.

By establishing early communications with personnel on a fire more immediate action on law enforcement can be obtained. The transmittal of evidence to overhead by fire guards, etc., in many cases, can facilitate prosecution of delinquents. Action on many cases of law enforcement has been withheld in the past due to a failure to get information to proper authorities without excessive loss of time.

In the systematic processes of fire control, the primary requirement is the elimination of excessive loss of time. With very few exceptions, suppression forces have the greatest advantage in the early burning stages of a fire. Wireless communication has and can reduce "elapsed time" through facilitating better placement of detection crews, speeding up notification of suppression forces, making action possible from a near source, and increasing efficiency in suppressing a fire by facilitating the procurement of personnel, equipment and supplies.



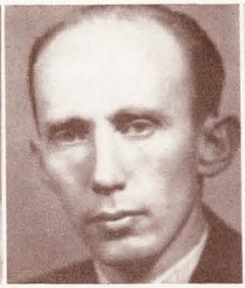
FACULTY

CLASSES

AND

ORGANIZATIONS

## THE FORESTRY FACULTY



### Dean Paul M. Dunn

Paul, as he is known to all Utah State Foresters, was born at Lennox, South Dakota in 1898. in 1917 he joined the call to arms and spent two years on the Mexican Border and in France. Leaving the army, he attended school at Iowa State College, receiving his B.S. degree in 1923. From 1923 to 1925 he worked on his master's degree at Ames, but due to other duties did not receive it until 1933. From 1925 to 1926 he worked in the circulation department of the Illinois Farmer, and from 1926 to 1931 served as Associate State Forester in Missouri. In 1931 he came to Utah State and assumed the duties of Associate Professor of Forestry and Extension Forester. In 1935 he became professor in charge of the School of Forestry and in 1938 he was made the Dean of the School of Forestry.

### Dr. Laurence A. Stoddart

"Doc" Stoddart, born at Trinidad, Colorado, in 1909, spent his early life in Colorado. He received his early education in that state, graduating from Colorado State Agricultural College with a B.S. degree in 1931. Returning to Colorado State he received his M.S. degree in 1932. The next two years he spent at Nebraska and received his doctor's degree in 1934. He served as Range Agent for the Soil Conservation Service in the Pacific Northwest from 1934 to 1935 and then came to Utah State in the fall of 1935 as professor of Forestry in charge of Range Management. In addition to his duties in the Range Department, he also serves as Ecologist for the Utah Experiment Station.

### Dr. D. I. Rasmussen

"Doc Ras," as he is known to all Forestry students was born at Mt. Pleasant, Utah, in 1903. He attended the Brigham Young University and received his B.S. degree from there in 1928. Continuing his studies at the University of Illinois, he received his M.S. from this institution in 1930. Working under a fellowship, he completed the requirements for a Ph.D. degree in 1932. From 1932 to 1933 he served as Assistant Biologist for the Illinois State Natural History Survey and as a Technician in the U. S. Forest Service from 1933 to 1934. He came to Utah State in 1934 as Professor of Wildlife Management and in 1935 was made Associate Biologist in charge of the Wildlife Experiment Station.

### Professor George H. Kelker

Professor Kelker, born in Ohio in 1906, spent the early years of his life in his home state and graduated from Hiram College at Hiram, Ohio in 1928 with an A.B. degree. From 1928 to 1929 he taught school at a high school in Cleveland. Returning to school at the University of Michigan, he received his B.S.F. degree in 1931 and his M.S.F. in 1932. From 1933 to 1935 he served as Technical Foreman in a C.C.C. camp, and then in October, 1935 returned to Michigan to do post graduate work and has now completed residence requirements for his Ph.D. degree. He came to Utah State in August, 1937, and assumed his duties as professor in charge of Wildlife Management at that time.

## Dr. Robert P. McLaughlin

"Doc" McLaughlin was born at Sedalia, Missouri, in 1898. Migrating around the country, he finally settled down at Moscow, Idaho and received his B.S. degree from the University of Idaho in 1925. Then continuing his studies, he received his M.S. from Yale in 1926 and his Ph.D. in 1932. From 1927 to 1928 he was Assistant Professor of Forestry at Michigan State College and held the same position at Minnesota during 1929. In 1933 he became superintendent of C.C.C. Camp Roosevelt in Connecticut, and came to Utah State in 1935 as Associate Professor of Forestry.

## Professor George H. Barnes

George, as he is known to all faculty members, was born in British Columbia in 1901. He spent his youthful days wandering through the Canadian forests and then received his B.S. degree from the University of Washington in 1924. Continuing his studies at the University of California, he received his M.S. degree in 1929. He spent ten years with the British Columbia Forest Service, dealing chiefly with research work or mensuration and management problems. He came to Utah State in the fall of 1936 as Assistant Professor of Forestry.

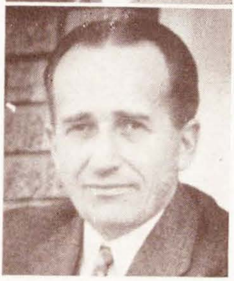
## Professor Arthur D. Smith

"Art," as everybody calls him, was born in the wide open spaces of Idaho in 1909. Civilization got the best of him, and he began his education. After spending two years on a mission for the L. D. S. church, he went to the Weber Junior College at Ogden, Utah, and then to Utah State. He received his B.S. degree in 1937 and then went to the University of California on a fellowship. Receiving his M.S. degree in 1937, he returned to Utah State to take over duties as Assistant Professor of Range Management. His chief worry is teaching students the principles of range management.

## Professor J. Whitney Floyd

"Whit" was born in Driggs, Idaho in 1903. He came to Utah State to receive his B.S. degree in Forestry in 1935, after having served one year as president of the Utah Foresters club. From 1932 to 1935 he was employed by the U. S. Forest Service on insect control projects, as Forest Guard, Recreational Planner, and Jr. Forester. In 1936 he returned to Utah State as instructor and Extension Forester, being promoted the following year to Assistant Professor in Forestry and retaining his title of Extension Forester. In 1938 he attended the University of California for the first semester.

## Dr. Stillman Wright,



Dr. Wright was born at Chicago, Illinois in 1898. In 1921 he received his B.S. degree from Beloit College. From 1922 to 1924 he served as a teacher in South Dakota and then went to the University of Wisconsin in 1924 as assistant Zoologist. He received his Ph. D. from Wisconsin in 1928, meanwhile serving as Assistant Aquatic Biologist with the Bureau of Fisheries from 1927 to 1933. In 1933 he was employed by the Brazilian Fisheries Commission and spent four years in Brazil making an environmental survey of the waters there. In 1938 he again became Associate Aquatic Biologist in the U. S. Bureau of Fisheries and was stationed at Utah State. Here he continues his research and assists graduate students in fisheries work.

## CLASS OF 1939

LLOYD NELSON ANDREWS, Logan
Wildlife Management
Summer '36, Great Basin Exp. Sta.
Summer '37, Wasatch Branch Exp. Sta.

HAROLD L. BAKER, Ogden
Forestry
Phi Gamma Rho
Phi Kappa Phi
Summer '37 Trail Const. and Main.
Challis N. F.

LYLE A. BAKER, Ogden
Forestry
Phi Gammo Rho
Phi Kappa Phi
Utah Juniper Staff
I. F. & R. E. S. '37
Foreman U. S. A. C. Nursery '38

MERRILL H. CARLSON, Ogden
Alpha Zeta
Summer '37, T. S. I. Wasatch N. F.
Summer '38, Timber Survey, Cache
N. F.

HAROLD W. COOPER, Bancroft,
Idaho
Range Management
Summer '36, Forest Guard, Cache N. F.
Summer '37, Range Inspector, A. A. A.
Summer '38, Forest Guard, Teton N. F.

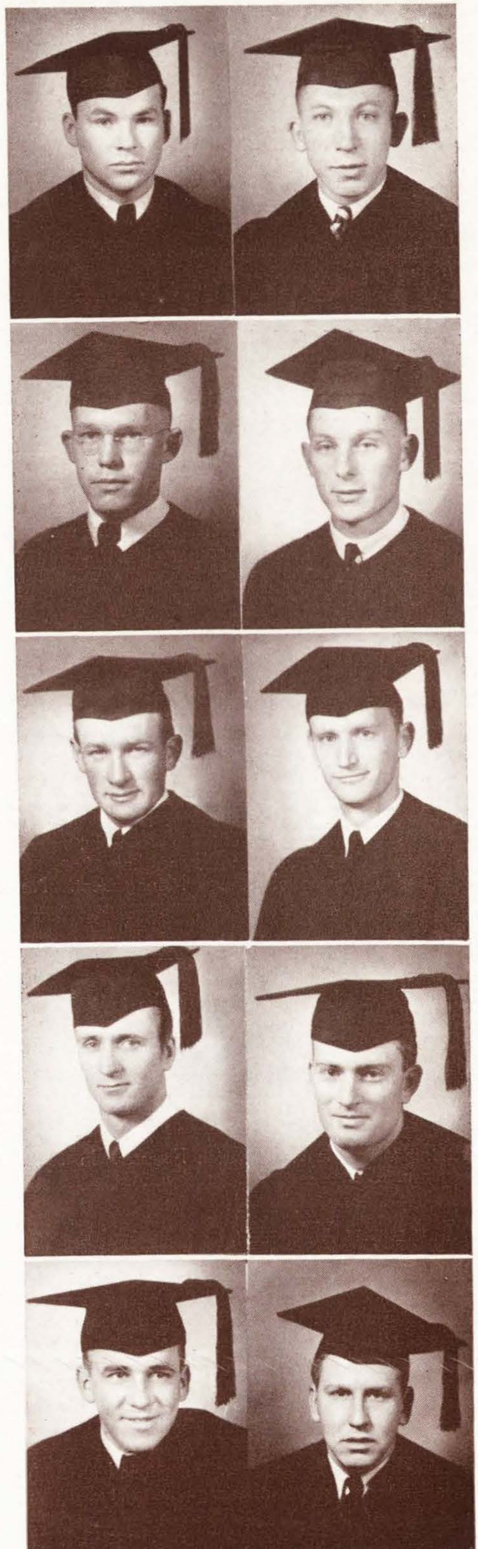
RANGWELL N. CHRISTENSEN,
Ephraim
Range Management
Summer '37, I. F. & R. E. S.

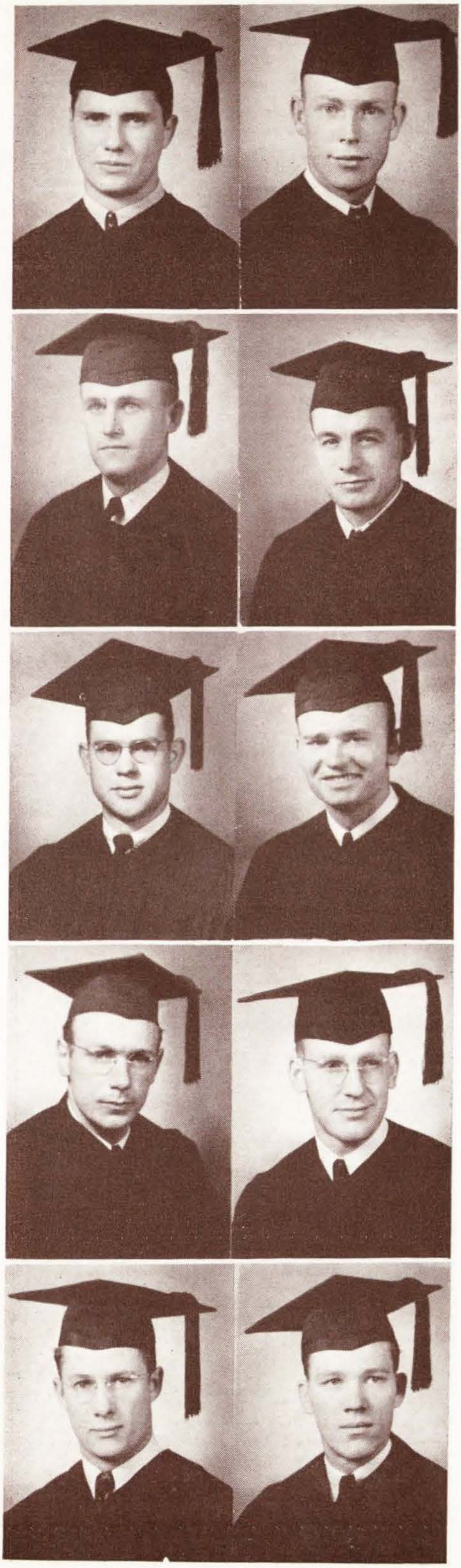
STEPHEN B. ELLIS, Logan
Range Management
Foresters Rifle Team Mng.
R. O. T. C. Rifle Team
Band, Drum Major
Summer '37, Range Inspector,
U. S. F. S.
Summer '38, Range Inspector, A. A. A.

JEDD WATKINS FARR, Los Angeles,
Calif.
Wildlife Management
Summer '36, Park Naturalist, Angeles
N. F.

STANLEY P. GESSEL, Providence
Range Management
Phi Gamma Rho
Phi Kappa Phi
Alpha Zeta
Summer '35, '36, Tech. Student C. C. C.
Summer '37, '38, Utah Agr. Exp. Sta.

GAVIN GOUDIE, Salt Lake City
Range Management
Sigma Nu
Summer '36, Div. Graz., C. C. C.
Summer '37, Student Tech. Div. Graz.
Summer '38, Range Survey, Div. Graz.





## CLASS OF 1939

DEWITT C. GRANDY, Paris, Idaho
Range Management
Phi Gamma Rho
Alpha Zeta
Wrestling, '38, '39
Summer '38, Range Inspector, A. A. A.

LLOYD F. GUNTHER, Lehi
Wildlife Management
Summer '38, Sage Grouse, U. S. A. C. Wildlife Exp. Sta.

J. BOYD GURR, Salt Lake City
Forestry
Sigma Phi Epsilon
Summer, '36, '37, S. L. C. Water Dept.
Summer, '38, Forest Guard, Cache N. F.

HARLEY M. HANDY, Preston, Idaho
Range Management
Summer, '37, Student Tech. Div. Graz.
Summer, '38, Student Ass't. S. C. S.

ROBERT L. HANSON, Providence
Forestry
Summer, '36 Student Ass't, C. C. C.

DEAN HOBSON, Salt Lake City
Wildlife Management
Utah Foresters, President '38-'39
Phi Gamma Rho
Summer '36, Botany Dept. U. S. A. C.
Summer '37, Fire Guard, Flathead N. F.
Summer '38, Fire Guard, Lolo N. F.
Spring '39, Beaver Survey, Wildlife Exp. Sta.

GRANT HARRIS, Logan
Range Management
Beta Kappa
Summer '36, Tech. Student, Desert Rng. Exp. Sta.
Summer '37-'38, Student Ass't., Arrowrock

PAUL ROLLINS HARRIS, Logan
Range Management
Summer, '37, Range Survey, Div. Graz.
Summer, '38, Forest Guard, Wasatch N. F.

HAROLD D. JOHNSON, Victor, Idaho
Range Management
Summer '35, Timber Survey, Targhee N. F.
Summer '37, Range Inspector, A. A. A.
Summer '38, Range Examiner, R. S. A.

JACK N. JORGENSEN, Hyrum
Forestry
Summer '36, Tech. Student, C. C. C.

## CLASS OF 1939

WALTER H. KITTAMS, Great Falls, Montana
Wildlife Management
Phi Eta Sigma
Phi Gamma Rho
Phi Kappa Phi
Summer '38, Temporary Park Ranger, Yellowstone Nat'l Park

WILLIAM KRUEGER, Bingham Canyon
Forestry
Sigma Nu
Summer '38, Blister Rust Control, Avery, Idaho

ORVAL H. LADLE, Mendon
Forestry

LAMAR MASON, Springville
Range Management
Utah Foresters, V- Pres. '38-39
Alpha Zeta
Phi Gamma Rho
Phi Kappa Phi
Summer '37, Student Ass't Great Basin Exp. Sta.
Summer '38, Lookout-fireman, St. Joe N. F.

R. KEITH MELLOR, Manti
Range Management
Summer '37, Division of Grazing
Summer '38, Range Surveys, A. A. A.

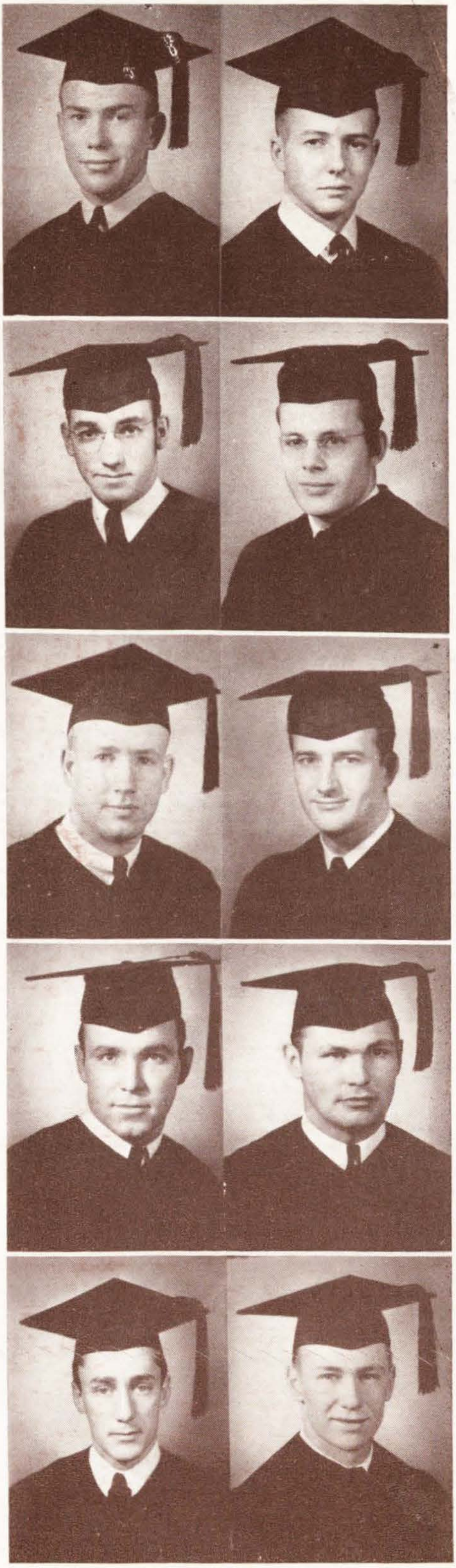
EDWARD MILLARD, Dietrich, Idaho
Wildlife Management
Track
Summer '37, Range Surveys A. A. A.

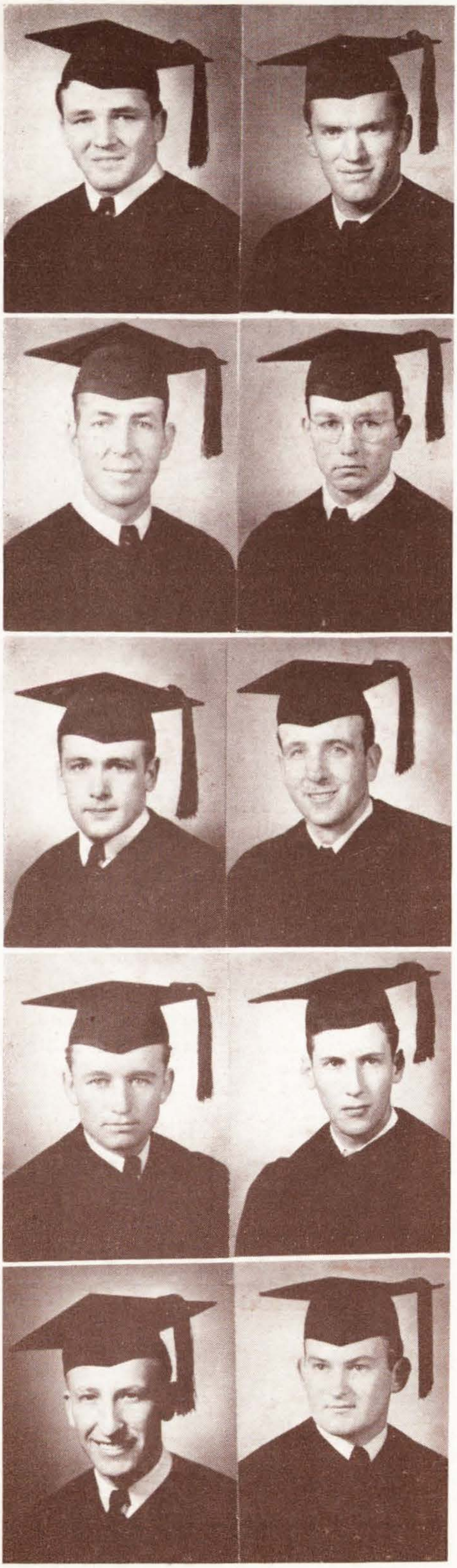
GARNETT PLAYER, Murray
Forestry
Football
R. O. T. C. Officer

PAUL S. RATTLE, Pasadena, Calif.
Forestry
Summer '34-38, Forest Guard, Angeles N. F.

ROYAL RHOTON, Lakeside, Arizona
Forestry
Summer '38, Forest Guard, Sitgreaves N. F.

REED P. ROBINSON, American Fork
Forestry
Summer '38, Timpanogas Nat'l Monument





## CLASS OF 1939

ACIL R. ROUNDY, Springville
Range Management
Alpha Zeta
Summer '37, Student Ass't. Desert Rng. Exp Sta.
Summer '38, Guard, Nevada N. F.

ERVIN M. SCHMUTZ, St. George
Range Management
Phi Gamma Rho
Phi Kappa Phi
Summer '37, Range Inspector, S. C. S.
Summer '38, Fire Guard, Wasatch N. F.

ERSCHEL SHEPHERD, Vernal
Forestry
Sigma Phi Epsilon
Summer '36-'38, Fire Guard, Ashley N. F.

GILBERT C. SMITH, Jackson, Wyoming
Forestry
Summer '37-'38, Guard, Teton N. F.

EARL SPENDLOVE, Hurricane
Range Management
Summer '38, S. C. S., Caliente, Nev.

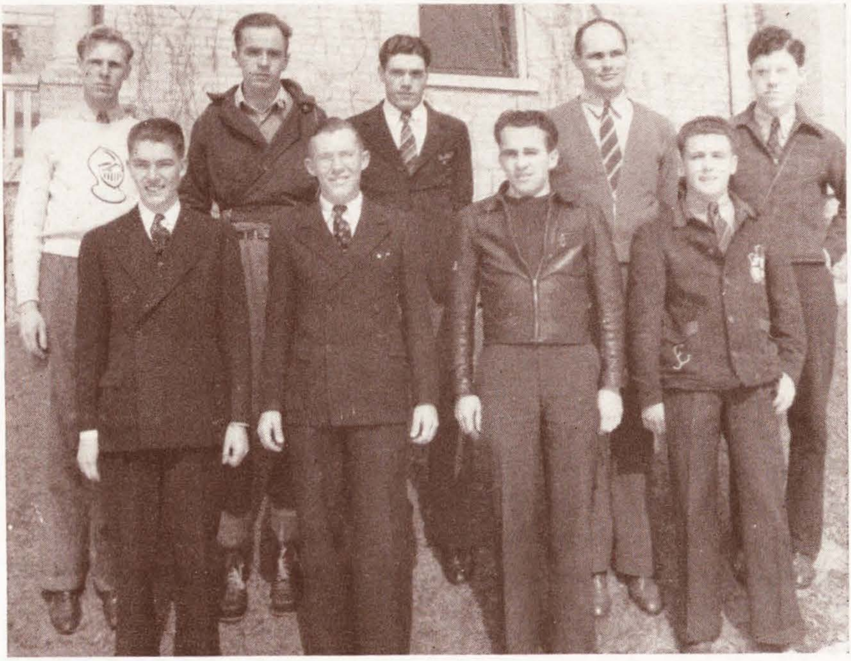
JULIAN R. THOMAS, Heber
Range Management
Phi Gamma Rho
Summer '37-'38, Forest Guard, Cache N. F.

DUANE TURNER, Tooele
Forestry
Alpha Zeta
Summer '36, Desert Range Exp. Sta.
Summer '38, Soil Conservation Service

HERBERT G. VANCE, Ogden
Forestry
Summer '37-'38, Fire Guard, Idaho N. F.

J. DONALD WADSWORTH, Logan
Forestry
'33-35, Cultural Foreman, T. V. A.
'35-38, Superintendent, C. C. C. Camp, Fort Bennington, Georgia

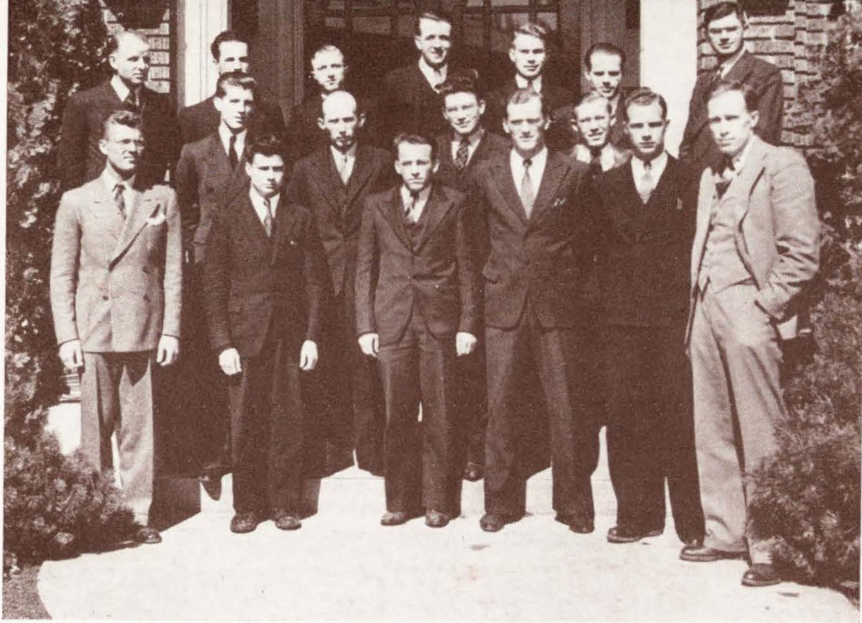
SPENCER L. WHITAKER, Kanosh
Wildlife Management



*First Row: Scherbel, L. Baker, Gessel, Spendlove.*
*Second Row: Hey, Chatelain, Speirs, Rattle, Smith.*
*Absent: Todd, S. Baker, Professor Barnes.*

## UTAH JUNIPER STAFF

| | |
|---|---|
| Stanley Gessel | *Editor* |
| Professor Barnes | *Faculty Advisor* |
| Frantzen Todd | *Assistant Editor* |
| Harold Speirs | *Assistant Editor* |
| Edward Chatelain | *Business Manager* |
| Lyle Baker | *Business Manager* |
| Simon Baker | *Assistant Business Manager* |
| Earl Spendlove | *Staff Artist* |
| Bob Hey | *Photographer* |
| B. C. Smith | *Photographer* |
| Paul Rattle | *Staff Writer* |
| Paul Scherbel | *Staff Typist* |



PHI GAMMA RHO FRATERNITY
*First Row: Jones, Grandy, Gessel, Schmutz, Bowers, Stoddart.*
*Second Row: Blaisdell, Rasmussen, Cliff, Baker.*
*Third Row: Smith, Shafer, Todd, Thomas, Kittams, Mason, Kelker.*

## PHI GAMMA RHO

March 26, 1936, the honorary forestry fraternity, Phi Gamma Rho, was organized on the Utah State campus. The primary purposes of its organization were to stimulate high scholastic attainment among students of forestry, aid in social activities, develop the personality and character of its members, and irradiate principles of conservation to the general public.

In order to carry out these objects, meetings, featuring some leader in the various schools of the college have been held once a month in the men's lounge. Problems which pertain to fields other than Forestry have been discussed as a means of stimulating the members to a broader viewpoint. An added attraction has been the refreshments served at the close of each meeting.

The honor plaque, a project of past years has been continued and in addition a trophy case is being made to hold the rapidly increasing trophies of the school.

Phi Gamma Rho seeks and accepts only those seniors and juniors in the School of Forestry who have shown ability by high scholastic attainment and leadership activities in the school.

Active members of Phi Gamma Rho are: Stanley Gessel, president; Ervin Schmutz, vice president; John McDonald, secretary-treasurer; DeWitt Grandy, ranger; Dean Paul M. Dunn, Dr. L. A. Stoddart, Dr. R. P. McLaughlin, Dr. D. I. Rassmussen, Professor George H. Kelker, Professor George H. Barnes, Professor J. Whitney Floyd, Professor Arthur D. Smith, faculty advisor; Glen Jones, Lyle Baker, Lamar Mason, Julian Thomas, Everett Doman, Walter Kittams, Reuel Jansen, Frantzen Todd, Jack Major, Harold Baker, Kenneth Bowers, Oliver Cliff, Pershing Blaisdell, Paul Shafer, Harold Hiner, Elliot Killpack, John Quayle, Max Robinson, Lorin Dedrickson, Edward Chatelain, Max Clinkinbeard and John Hampton.

UTAH FORESTERS

UTAH FORESTERS

"CHIPS FROM THE UTAH AXE"

*Scherbel, Parry, Rattle, Todd.*

## "CHIPS"

For several years there has been a need for a forestry news sheet at our school which would give the current news of the departments of forestry, range, and wildlife, coupled with certain announcements and notations every member of the school should be familiar with.

With the help of department finances and the suggestions of Dean Dunn and Dr. Stoddart, the first issue of "Chips" was mimeographed on October 18th under the direction of Paul S. Rattle, editor. In a short time Frantzen Todd was chosen as assistant editor, and Paul Scherbel as staff member to handle outside news and exchanges. Secretarial help was furnished by the Dean with the services of Miss Faye Parry.

"Chips" comes out Tuesday of every week, four pages thick, 200 copies strong. At the present writing there is a mailing list of over thirty copies which go to various graduates; other forestry schools; and forest, range, and wildlife agencies throughout the western United States.

CLUB OFFICERS
*First Row: Gessel, Scherbel, Roundy, Speirs.*
*Second Row: Rattle, Hobson, and Mason.*

## AN EDITORIAL

*By* Dean Hobson

We, the Utah Foresters, have weathered another school year—217 strong—and indeed one of the most successful of our history. Our traditions persisted and grew; our conquests flourished. We proved our leadership in competition with other campus clubs by Paul's Party, the most widely propagandized and most popular student body dance of the year, by garnering hands down, the Winter Carnival trophy, by our blue ribbon Ag Show booth, and by our red ribbon Homecoming Day float. Foundations were laid for annual Forestry Alumni Breakfasts at Homecoming time, occasional joint meetings with other campus clubs, a new Association of Western Forestry Clubs, a dynamic feud with a lively bunch of Engineers, which did more to boost both clubs into prominence than any other one stroke; a weekly Forestry School publication, "Chips"; and the introduction to the student body of certain prominent speakers. The Utah Juniper, our annual publication, maintained its expected high standards. Our usually brilliant fun-fests, barbecue, skating parties, dances, banquets, and meetings excelled all previous ones.

A bounteous year—Utah Foresters.

Nor should the failures go unmentioned, for what shall be the purpose of such an article if it is not to present a complete picture of our year so that future years may find guidance. Even our sorry display at Open House, miserable though it was, was worth experiencing. It uncovered our crowning weakness, the one cancerous care, which more than any other one feature, dooms to destruction any group dependent upon unity for strength—poor organization and the word "poor" in this sense weathers severe abuse for ours wasn't even poor organization, it was wholly lacking. Nor was it the fault of the members, for didn't they, when the occasion arose, walk 217 strong through unopened doors of the enemy's lair to rescue their patron saint?

Future leaders—and that is not restricted to officers—yours is the job of finding something vital which will detonate every grain of your organization in a bombshell of animation and enthusiasm, which will tear from their shells the clam dwellers, which will kick sand in the eyes of the head coverers, which will give a hot pin thrust to the "putter-offers," which will nudge into life the drifters and prod into action the laggards.

A single year won't do it, but you must build—build, maintain your strength in those fields in which you serve as the pace setters, surpass those second place efforts, and eliminate failures. Then yours will be success and crowning achievement, and what is more, then you will be a club.

## SCHOOL OF FORESTRY ROLL CALL

### GRADUATE STUDENTS

Anhder, Theo.....R
Anderson, Paul.....R
Bunderson, Victor.....R
Cliff, Oliver.....F
Couch, Joseph.....F
Dorius, Floyd.....R
Ellison, Don.....F
Evans Tom.....W
Haas, Phillip.....W
Hales, Doyle C.....R
Hanson, Wallace R.....R
Harris, Richard.....R
Hurst, William.....R
McCracken, Joe.....F
McDowell, Harley M.....R
Nelson, Marcus.....W
Peterson, Virgil.....R
Richman, Val.....R
Shaw, Wesley.....W
Smith, Frank J.....R
Thomson, Reed.....R
Townsend, William.....F

### SENIORS

Andrews, Lloyd.....W
Baker, Harold.....F
Baker, Lyle.....F
Barney, Marvin.....R
Blaisdell, James P.....R
Brown, Scott R.....F
Carlson, Merill H.....F
Christensen, Rangwell.....R
Cooper, Harold.....R
Davis, Don.....F
Decker, Rex.....F
Ellis, Stephen B.....R
Farr, Jedd.....W
Gaufin, Marshall.....W
Gessel, Stanley.....R
Goudie, Gavin.....R
Grandy, DeWitt.....R
Gunther, Lloyd.....W
Gurr, Boyd.....F
Handy, Harley.....R
Hanson, Robert.....F
Harris, Grant.....R
Harris, Paul R.....R
Hobson, Dean.....W
Johnson, Harold.....R
Jorgenson, Jack N.....F
Kittams, Walter.....W
Krueger, William T.....F
Ladle, Orval.....F
Mason, Lamar.....R
McDonald, John E.....R
Mellor, R. Keith.....R
Millard, Edward.....W
Morrison, John.....F
Onstott, Oscar.....W
Peters, Edward L.....F
Player, Garnett.....F
Quigley, Glen.....F
Rabb, Joseph C.....W
Rattle, Paul S.....F
Rhoton, Royal.....F
Rich, Harvey.....F
Robinson, Reed.....F
Roundy, Acil.....R
Schmutz, Ervin.....R
Shafer, Paul.....R
Shepherd, Erschel.....F
Smith, Gilbert.....F
Sorenson, Leon.....R
Spendlove, Earl.....R
Spilsbury, Berkeley.....F
Taylor, Thomas.....W
Thomas, Julian.....R
Turner, Duane.....F
Vance, Herbert G.....F
Wadsworth, J. Donald.....F
Whitaker, Spencer.....W
Winters, Arthur.....R

## JUNIORS

Ahlm, Arthur .......... F
Anderson, Ray .......... R
Ashcraft, H. Wayne .......... W
Austin, Lawrence .......... W
Bagley, Andrew S. .......... F
Bean, Roy .......... W
Bishop, Merlin .......... R
Blakely, Robert .......... W
Bower, Kenneth .......... F
Brown, Thomas .......... W
Buckley, Dearl .......... R
Call, Garland .......... F
Chatelain, Edward .......... W
Clinkinbeard, Max .......... F
Cooper, Talmage .......... F
Coray, Max S. .......... R
Crowley, Jerry N. .......... F
Davis, Lawrence .......... R
Dedrickson, Lorin .......... W
Erickson, H. Keith .......... R
Finlinson, Joe. L. .......... R
Frischknecht, Neil .......... R
Gabardi, Clarence .......... F
Gooding, Robert .......... F
Grace, Harry D. .......... R
Green, Lisle .......... R
Hampton, John .......... F
Hardin, Joe Cecil .......... W
Hearrell, David C. .......... W
Hiner, Harold .......... R
Hinton, Clemons .......... R
Janson, Reuel .......... W
Jensen, Ned L. .......... F
Johnson, Maurice .......... F
Killpack, Elliott R. .......... R
Madsen, Vaughn .......... W
Maier, Oscar W. .......... W
Major, Jack .......... R
Marston, Richard .......... R
McAllister, R. Bernell .......... R
Meibos, John .......... W
Mitchell, Albert .......... F
Nelson, Noland .......... W
Nelson, Torvall L. .......... F
Okeson, Kenneth W. .......... F
Olsen, Reid P. .......... F
Palmer, Marcel .......... R
Payne, Richard .......... F
Peterson, Allan .......... F
Phelps, James .......... W
Phillips, Tom .......... R
Quayle, John Wm. .......... R
Ralph, Sidney .......... F
Ramelli, Lloyd .......... W
Rees, Max .......... R
Richardson, Dee .......... F
Robinson, B. F. .......... R
Robinson, Max E. .......... R
Rudolph, Victor .......... F
Scherbel, Paul .......... R
Sevy, Thomas .......... R
Sharp, Lessil .......... R
Shilling, George .......... W
Skidmore, H. J. .......... R
Smith, Eldon .......... W
Snapp, Nathan .......... W
Speirs, Harold .......... R
Starbird, James F. .......... F
Todd, Frantzen .......... R
Udy, Jay .......... W
White, Donald G. .......... W

## SOPHOMORES

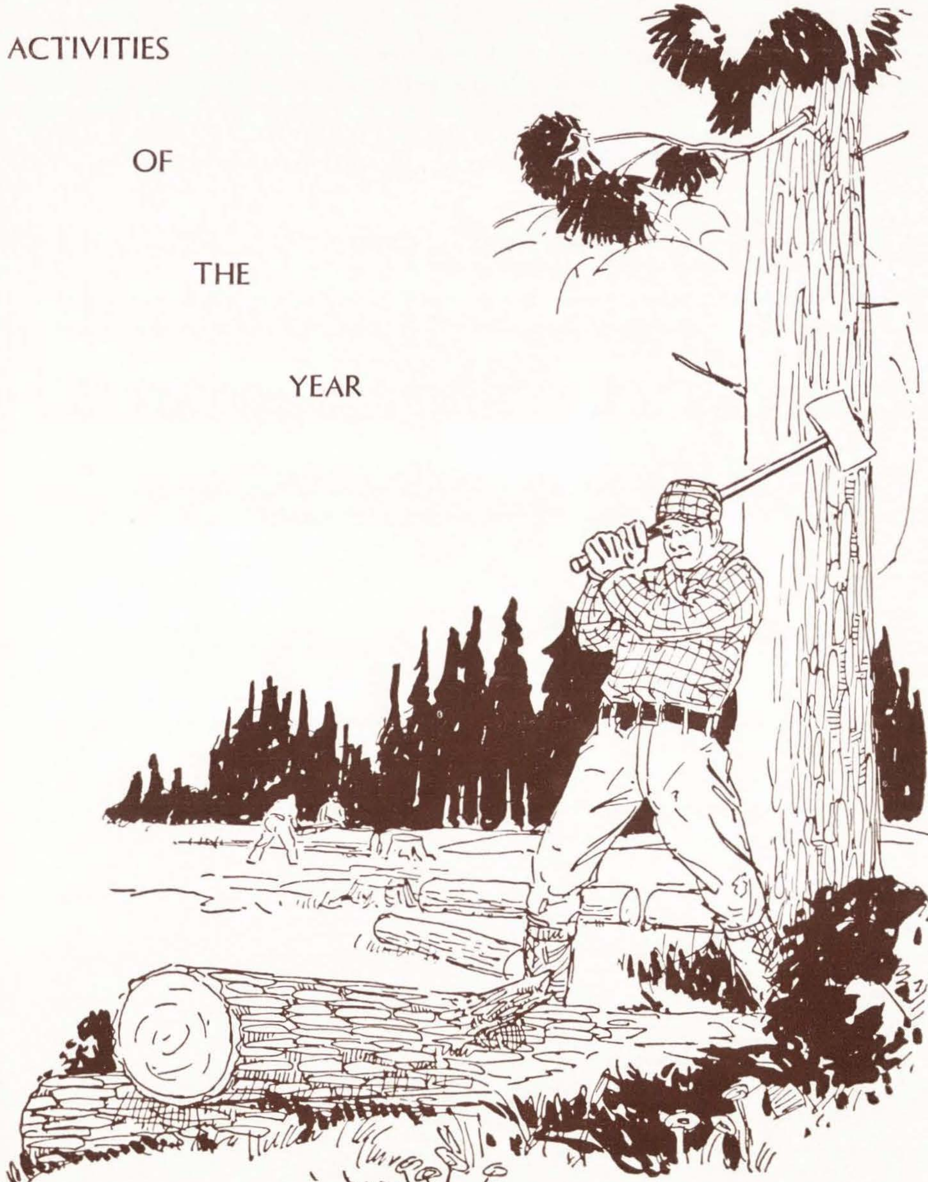
Balcam, George .......... F
Bergen, Luther .......... W
Bernhard, John .......... F
Billings, Worth .......... R
Bocz, Rudolph .......... F
Bowens, William .......... F
Brown, DeAlton .......... F
Brown, Omar .......... R
Burt, John E. .......... F
Calderwood, Spencer .......... F
Carey, Robert R. .......... R
Carroll, Thomas .......... R
Colton, Lawrence J. .......... F
Cook, Loyal .......... R
Cox, Elmer .......... F
Forsgren, Phillip .......... W
Gooch, Rex .......... F
Guyman, Wayne .......... R
Hansen, Gene .......... R
Haycock, W. G. .......... R
Hermansen, Burl .......... F
Hey, Robert .......... F
Hofer, Ernest .......... F
Hotchkiss, Edward .......... F
Howard, Paul L. .......... R
Howe, Ralph D. .......... F
Jamison, Dewey .......... W
Jenkins, Paul .......... R
Jensen, Lyle .......... F
Kasler, Charles L. .......... F
Keate, Kenneth .......... F
Kruse, E. Gleason .......... F
Lake, Bruce .......... R
Landes, Lee W. .......... R
Lassen, Robert .......... W
Latimer, David S. .......... W
Lipman, Nathan .......... W
Lofthouse, Edwin .......... R
Logan, Stanley .......... W
Lown, W. E. .......... W
Maycock, Clyde .......... F
Meldrum, Clarence R. .......... F
Merrill, Leo .......... F
Merritt, Allen F. .......... W
Mitchell, Yale .......... F
Nisson, Darrell .......... F
November, Harry J. .......... W
Okpisz, Alfred J. .......... F
Patterson, James .......... F
Perkins, Franklin .......... R

Pierce, Dale R.....R
Putnam, Max L.....F
Remund, Junius.....F
Rogers, Max.....R
Rosenberg, Ephraim.....R
Shaw, William D.....F
Smith, B. C.....F
Speakman, Vaughn.....F
Staples, G. E.....R
Stevens, Ward.....F
Taft, Kay.....R
Thorrell, Roy.....W
Tinsley, Kenneth.....F
Truden, Andrey.....R
Tucker, John P.....F
Van Cott, John W.....R
Vasileff, Vasil.....W
Weaver, Rex.....F
Wilcox, Neil.....R
Williams, G. O.....R
Work, Robert E.....W
Young, Robert D.....W

## FRESHMAN

Allen, Stanton L.....R
Baker, Simon L.....F
Ballard, William.....W
Bell, Phillip K.....F
Bendixen, Gene.....F
Benedict, Edward R.....R
Bjarnson, Ray.....R
Boyle, Archie W.....F
Boyle, Wayne.....F
Brown, Dick.....F
Brown, Robert E.....F
Buckley, Wallace.....F
Buttars, Ronald.....F
Buttars, Vernon.....F
Carroll, Thomas.....F
Clark, Cory De.....F
Clark, Eldon.....R
Cooper, Hugh R.....F
Corey, Robert E.....F
Crane, R. Keller.....F
Crookston, Lynn B.....F
Davis, David Frank.....F
Davis, Playford.....F
Denning, Ronald J.....R
Ernch, David.....F
Ewell, Frank.....F
Fast, Eugene.....F
Forsberg, Leo T.....W
Frazier, Garth.....F
Frei, Donald C.....F
Gabriel, Samuel.....F
Gammill, Walter.....F
Gatherum, Morris J.....F
Gianque, Clarence.....F
Gloeckner, Sidney R.....F
Gross, Eugene.....F
Hall, John M.....R
Hall, Mervin.....F
Hampton, Kenneth.....F
Hampton, Rex.....F
Hansen, Howard L.....R
Hansen, Royce.....F
Harline, Glendon L.....F
Hart, Jeddie.....F
Hawkley, Dean S.....F
Henderson, Duane M.....F
Herwitz, Jerome.....F
Hey, Robert.....F
Holliday, Blaine O.....F
Horowitz, Jerome L.....F
Hutchison, Charles.....F
Jackman, Leroy.....F
Jensen, C. J.....F
Jensen, Reed L.....F
Johnson, Bernard.....W
Judd, Leroy P.....F
Killpack, Jethro.....F
Larsen, Glen.....F
Larsen, Willard.....F
Laver, Clyde.....F
Lewis, Guy.....F
Liston, Russell.....F
LoVerme, Dominick M.....F
Lund, Russell.....F
Matthews, William L.....R
Moffitt, Jackson.....F
Mueller, Harry J.....F
Murdock, Robert S.....F
Nelson, James W.....F
Olsen, Odell.....F
Parker, Frank.....F
Patterson, Hugo.....F
Peabody, T. L.....F
Perkins, Frank.....F
Porath, Preston.....F
Porterfield, John A.....F
Pugh, Edwin Reed.....F
Quinn, Joseph.....F
Rasicot, Frank L.....F
Rozynick, William.....F
Rouse, Burt Frank.....W
Schainwooks, Melvin.....F
Schneider, Jerome.....F
Seifert, William F.....F
Shippel, Allen.....W
Sharp, L. F.....R
Shaw, William Dean.....F
Sidorsky, Abraham.....F
Sjoblom, Duane.....F
Soolmon, Charles.....W
Stephens, Charles.....W
Taylor, Kenneth.....R
Umstattd, Lee.....F
VanCott, John W.....R
Van Matre, Merlin.....W
Vaughn, Norman.....F
Walker, Ray.....F
Watkins, Donald.....F
West, Morris.....F
Wilcox, Glen.....F

# ACTIVITIES OF THE YEAR



## THE FALL BARBECUE

Friday, October 7, was a very extraordinary day as are all days devoted to Utah State Foresters activities. It was the day of the annual Fall Barbecue and Old Sol exhibited his partiality to outdoor men by smiling the whole afternoon into Guinevah park located in Logan canyon whose rugged charm further enhances the typical forester's love of nature.

It was destined to be a great day for other eminent reasons also because all prognostications, traditions, customs, etc., were virtually tossed to the skies and the mighty Seniors displayed their unquestionable superiority by handing the reluctant Juniors a narrow (so to speak) but very decisive defeat. The Sophomores were successful in finishing in third place when they took the measure of the lowly Freshmen class who, incidentally, have been victorious the preceeding three years (whatsa matter Freshmen).

The final scores were tallied as follows: Senior, 40 (Hm-mm, looks funny); Juniors, 25 (if at first you don't succeed try again next year); Sophomores, 18 (lucky); and Freshmen 9 (my-o-my).

The feature of the day was the series of softball games played early in the afternoon. Interest ranked extremely high as the Juniors and then the Sophomores respectively vainly endeavored to set back the high-flying Seniors. Loyal Sophomore backers and the Juniors pooled their rooting sections along the sidelines and still were unable to rattle Stan Gessel and Steve Ellis, the Senior pitchers, whom they literally coaxed to "blow up." The Seniors, however, with their minds eye looking up to their mythical ideal, Paul Bunyan, survived all the mud slinging as only Paul himself could have done and scored their first victory of the day.

Simon Baker (another Baker boy), a Freshman, was successful in capturing the only first place his class was able to ascertain during the whole day. His chopping speed humbled the rest of the entrants. Steve Ellis, the seniors pride and joy in this event, perturbed the minds of his classmates by actually showing lines of strain in his face as he summoned his utmost effort for each stroke after a fast start. He later explained he had a weakness of foretasting the eats that were soon to follow.

The tug o'war further whetted each individual's propensity for food (this includes all those individuals who refused breakfast that morning) and as Heb Bingham made final preparations for eating, a bread line sprang into existence that resembles N.Y.A. pay day. The rapid disappearance of hamburgers and pies was accompanied by sweet strains of music from the voice of Glen "Lawrence Tibbit" Quigley as he sang some request numbers. Speaking of the eats disappearing, it was at this time when a great deal of talent was uncovered for some future pie eating contest. (Note: 'sa funny thing how little guys like Earl Spendlove can tuck away the grub). At any rate the climax of the day had been reached and as the shadows of dusk began to grow more intense the whole group of foresters turned homeward with satisfaction and pleasure deeply instilled in them. (What a full stomach won't do for a man).

## A VACATION IN SCHOOL

*By* Max Robinson

"Hey chum pass the beans! What's the matter with you, can't you see I'm hungry? Chase that hindquarter of beef past me, but slow it down. I'll starve if I don't get some of it." An irate glance from Doc. McLaughlin, a momentary silence and then the audible munching of forty-two hungry foresters as they satisfied a ceaseless hunger built up by days of "batching" life. These were the sounds which ushered in the 1938 summer camp.

Eating could not go on forever (the food ran out) so we retired to the great outdoors to find ourselves. After 270 days of soft city life and streets running in cardinal directions, we had to adjust to a mountain climate and landmarks which seemed a jumbled maze of directions. A few orientation trips served a double purpose: to acquaint us with such attractions as the U. S. Forest Service Nursery and to tighten our flabby "schoolboy" muscles. After this we were prepared for anything, even for the worst of Professor Whit Floyd's surveying course. "Bench Mark Hill" with its entanglement of choke cherry and aspen proved to be a unique place to start green foresters into what was hoped would be their profession. After stomping brush, cutting paths, and bending "ten inch" lodgepole pines over so that the range pole might be seen; after packing plane tables to the tops of high ledges and searching for red flags on "Rattlesnake Butte"; after chaining for hundreds of quarter miles; and after hunting for section corners in dense forests, we became hardy seasoned foresters that had—if not a knowledge of surveying—a conceit equal to any professional engineer.

Next our minds were enlightened with the knowledge that beamed from the countenance of Arthur D. Smith, the professor who believed that range survey principles were taken from the Bible and palatability tables were found on the "Golden Plates." He began our education in range management by teaching us everything from how to artificially graze the range, to how to estimate with precision the appetites of caterpillars. In a practical vein Professor Smith explained the procedure of saling the range and showed us the gist of slinging a diamond hitched pack on our faithful pickle-barrel burro.

Range management and surveying were forgotten however, as Professor Barnes led us into the mechanics of forestry. Under the cool shade of century old Douglas firs we cruised timber, worked on stand improvement, and obtained data for volume and yield tables. As the bitter must go along with the sweet, the pleasant days were climaxed by long nights of putting the data into usable form.

Professor Kelker, that methodical mathematical minded man from Michigan, turned our inquisitive minds to the problems of juggling all birds into the sparrow group to make his formulae work more effectively. We learned how to build stream deflectors, fish dams, and measure the flow of water by the "trumcoid" method. In addition Ramelli acquired the art of tracking down elk by their scat. Professor Kelker benefitted also; though he won't acknowledge it, we believe he learned how to fish.

Although the quest of learning the practical side of forestry was the motivating force in the actions of the group, social life of a distinct kind was carried on. Feminity, except for occasional visits of summer session students was completely absent. Lacking this restraining influence the boys carried on as only foresters can. The most active group toward this end was the "vigilantes," similar to the Ku Klux Klan, who terrorized the camp. Many unsuspecting victims deep in troubled sleep were awakened very rudely to find themselves floundering on the floor in a mat of quilts and blankets. Other courageous victims would boldly jump into bed at night, cautiously thrust a toe into a cool bed and then suddenly hit the ceiling as he contacted something cold and slimy. It is not accurately known who was active in this clan because depredations were carried on after the 10 o'clock lights had binked. Many suspicions were in order though and the tramp, tramp, tramp of militant feet made the identification of "H. H." and "O'Nelly" almost certain. Doc, coming in to restore order after one such escapade, brought modest "Chat" under observation as he found him in bed with his shoes on. Nothing conclusive could be proved though as Chat claimed he always slept that way. Lone wolves came into being to combat this evil and as a result fewer beds were overturned or put out in the night to air. But Davis and Sevy, the two "Clark Gables" of the camp, suffered heavily as they often came in late after serenading summer session blondes.

Camp life was not without its recreational and inspirational highlights. The former were adequately supplied by cool dips in Tony Grove and Bear lakes. Incidentally these dips turned out to be bad for some of the boys when schoolboy complexions were replaced by beautiful pinks. In a geological frame of mind the boys made a survey of Logan Cave and despite their best efforts none of them succeeded in getting lost. The most fascinating event occurred when Doc. McLaughlin, waking us at three o'clock a.m. to take us on a trip to the Bear River Bird Refuge, gave us the opportunity of seeing the Northern Lights. To see that flickering awe-inspiring light from the North is something we shall not forget.

Well it's over—the moans at having to clip meter plots, the crabbing about having to count rodent holes, guess at bird populations, estimate forage consumption, and watch caterpillars eat buckbrush. The clatter of pudding dishes and even the hum from "Deddy" as he meditated over the possibility of eating another piece of apple pie. All gone but not forgotten, written in the book of memories, they lie in wait for the day when a group of Utah State Foresters will again meet around a cheery camp fire and spin yarns of the long ago.

## TWELFTH ANNUAL BANQUET

Friday evening, March 10, 132 foresters and guests met at the Bluebird to attend the Twelfth Annual Banquet. Under the able direction of Toastmaster Walter Kittams laughter reigned supreme throughout the evening.

R. Scott Zimmerman, as principal speaker of the evening, acquainted us with some of the many problems in wildlife conservation. Dean Dunn told of the large number of graduates employed which, coupled with Regional Forester C. N. Wood's toast, makes the future look bright for us.

Those responsible for the affair were: Harold Hiner, Elliot Killpack, Richard Marston, and George Balcam.

## PAUL'S PARTY

Last year "Paul's Party" was inaugurated in honor of Paul M. Dunn, who was at that time commissioned Dean of the School of Forestry. The theme of that party was concerning Paul Bunyan, mythical American logger and woodsman, the patron saint of all true foresters. The function was financed by the student body, the whole school being invited.

Again this year the student body financed the affair and "Paul's Party" became an annual activity sponsored by the Foresters. Doyle Hales was chairman of the committee in charge of preparations, and under his direction Paul S. Rattle handled publicity, with Boyd Gurr and Tom Sevy handling decorations. Needless to say the entire club fell to and did a major portion of the work.

An assembly was held the afternoon before the dance, and with Paul S. Rattle as master of ceremonies, the "Bunyan" stories, and musical numbers were broadcast from the local radio station KVNU. This was the first radio broadcast ever to be made from the college auditorium. A special forestry issue of Student Life, campus newspaper, told of huge tracks left in the snow by Paul Bunyan when he arrived in Logan. The engineers had a lot to say about the activities and ended up by kidnapping Paul Bunyan from the fourth floor of our building and holding him for a ransom of 300 tickets. Needless to say, the ransom was not paid and consequently "Paul" was hung by the neck from the engineering building—much to the delight of the engineers and amusement of the student body at large.

Friday night, February 17th, the dance was successfully staged in a hall decorated with pine and sage. The four hundred couples in attendance each received a small statue of Paul Bunyan as a favor and later autographed "Paul's" 27-foot axe which was on display.

All this activity occurring during the week preceeding "Paul's Party" seems to lead to the establishment of a Foresters' Week next year. As evidenced by the favorable reception of the dance and assembly program, such a week would not be amiss. The dance was said to be the best function on the campus this year.

# JUNIPER HIGH

*Reid Olsen—Foresters phenomenal skier. Making a lake survey. The Juniper of fame. What foolishness is this? Andy snatches a little shut-eye. Controlling a small fire. And a good time was had by all—Paul's Party. Stem growth analysis.*

# LIGHTS



*Broadcasting the Foresters' assembly. The nation's champion Foresters' rifle team. The annual Foresters' banquet. The Great One in person. Foresters protest the action of engineers. Does everyone have a towel? One of Doc's ideas—weighing the summer camp students.*

## INTRAMURALS

*By* Duane Turner

The Utah Foresters has held its own in the stiff competition of the fraternity league of the U. S. A. C. intramural program. At this time (April 1) we are in sixth place, having collected 664 intramural points.

Scott Brown and Acil Roundy, co-managers during the fall quarter, organized and entered strong teams in all the events on the intramural docket. We lost our first softball game but went on to win the consolation crown. The fast "B" basketball competition saw us finishing in third place while in the ear-pulling contest we finished near the top. Burl Hermansen, our sophomore hopeful, won first place in the 165-pound event and President Dean Hobson collected a second place in the 185-pound competition.

Beginning the winter quarter, Harold Speirs replaced Scott Brown, who had served for the alloted three-quarters as co-manager. Under the direction of "Ace" and "Speirs," we continued to enter all events.

At the annual student winter carnival at Tony Grove the Foresters were crowned champs, walking away with practically all honors. Accumulating 169 points, we led Sigma Nu and Sigma Phi Epsilon, the two teams that tied for second with 92 points each. Sparked by Reid Olsen, Utah slalom champion and the Rocky Mountain amateur ski king, we placed first in every contest for men's organizations except the cross-country run. This was taken by Dearl Buckley, a forester performing for Sigma Nu (the son-of-a-gun). Olsen also took the down-mountain race and men's slalom, and Jack Major was second in both the slalom and cross-country events. The four-man snowshoe team composed of Ed Chatelain, Lorin Dedrickson, Tom Sevy, and Steve Ellis took top honors in this event, while the ski relay team made up of Talmadge Cooper, Nathan Snapp, Frank Davis, and Pershing Blaisdell walked away with the honors in this event.

The annual Foresters' Openhouse was an unqualified success. The seniors lived up to expectations by winning volleyball, basketball, handball singles, ping-pong doubles, and box hockey, as well as being high scorers for the evening

## ADVICE TO A FIRE GUARD

*By* Professor George H. Barnes

Conservation of our present timber resources and the growing of timber crops for future consumption predicates that they be successfully protected from fire until the time they will be required for use. If these resources cannot be protected reasonably well from destruction then there is little use of practicing any kind of forestry. Fire protection, therefore, is the first step toward any kind of sound forestry practice, and during the dangerous season of the year all else is put aside when necessary to combat the fire menace.

Just as fire protection is the first step in forestry, it is often the first of a would-be forester's job assignments. New men recruited for summer field work are usually assigned to some type of protection work as forest guard, smoke chaser, or patrolman. The impression a man makes on his superior officers in this role may play an important part in his future success as a forester.

Since many of the elementary protections jobs involve contact with the public, a proper public relations attitude is essential in dealing with it. Remember at all times that as a forest officer you are a civil servant. Your job is to serve the public to the best of your ability, and to treat them with respect and courtesy. Visitors to your district should be regarded as guests, and you should endeavor to make their stay a pleasant one. Do not allow them to impose on you, however, to such an extent that it interferes with your other duties. Some of your duties will be police-like in character. In the performance of these do not be officious. Polite requests usually accomplish much more than orders and tend to foster a spirit of cooperation with you.

Another item which cannot be stressed too highly is personal appearance. The public will judge the service largely from the contacts it makes with you. Many beginners think that the garb and appearance of the old backwoodsman type is appropriate for the job. This is a great mistake and will count heavily against the offender. So look your best at all times, even though it means rising five minutes earlier to do a little cleaning and polishing.

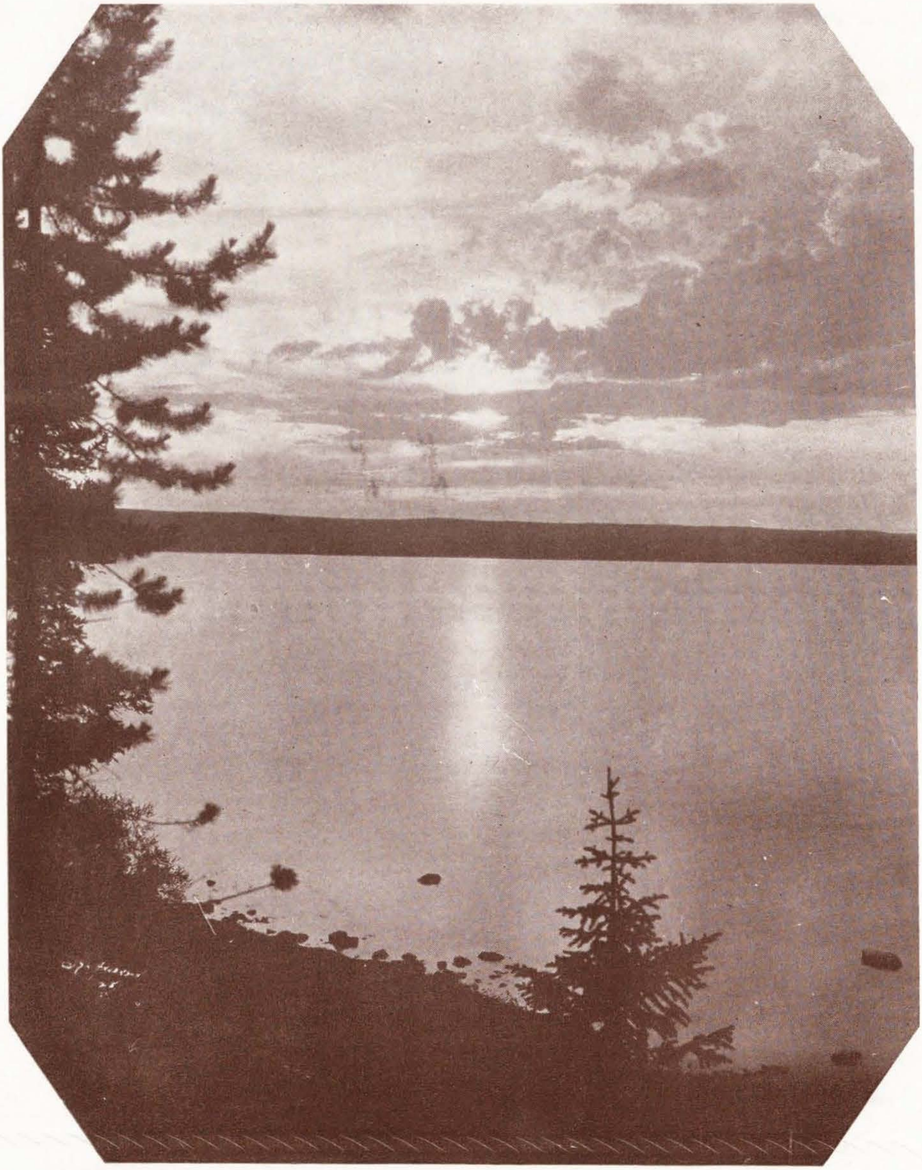
Your headquarters station should be kept in a neat and orderly condition both inside and out at all times. A good motto to adopt is "a place for everything and everything in its place." Station grounds should be clean and sanitary.

You will have innumerable miscellaneous routine duties to perform which if done well will keep you busy for a long day. In the midst of all these never forget that fire control comes first. Be ready at all times, night or day, to pick up your fire fighting outfit and be off within five minutes after notification of a fire. Five minutes is the get-away time expected of you. Travel steadily at a rate you can maintain. When you have located the fire, size it up and go to work and do not leave it until it is out.

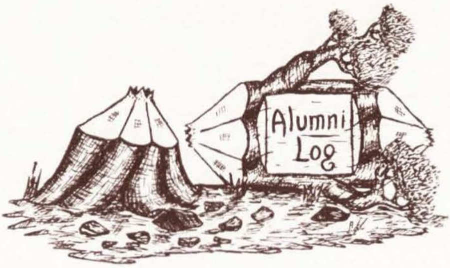
## IN MEMORIUM

*Sunset and evening star,*
*And one clear call for me;*
*And may there be no moaning of the bar,*
*When I put out to sea.*

—Tennyson



| | |
|---|---|
| PROFESSOR R. J. BECRAFT . . . | Class of '17 |
| FLOYD ALLEN . . . . . . . | Class of '36 |
| CARL ERIKSSON . . . . . . . | Class of '36 |
| FLOYD VINCENT . . . . . . | Class of '39 |




## TO THE ALUMNI

*By* Paul M. Dunn, *Dean*

Greetings to you, the Alumni of the Utah State Forestry School. We the faculty and the students salute you again. Another year has rolled around and we wish in a brief way to give you contact with your alma mater.

The school has had another fairly successful year. While the total registration dropped for the second time in years, there still were registered in 1938-39, over three hundred students. There was a continued increase in men from out-of-state. It seems that our school is gaining some recognition with the other schools in the country and is attracting men from all over the United States.

In order to give you some definite information in regard to happenings during the past year, I will account some of the major items.

This year saw the start of a building program at the Forestry summer camp in Logan canyon. The center section of the first permanent unit was practically completed. This unit, one of three, will be the dormitory. It will house forty-four men and the faculty. This first section incorporates in the basement the showers, toilets, furnace, hot water unit and on the main floor, sleeping quarters. The plans for this coming year include the completion of this center section and one of the two wings. It is hoped that within five years, we will see the completion of the three units, namely—the dormitory, the dining-hall-kitchen and administration building.

In regard to the camp, word was received that the buildings on the site have been released by the Civilian Conservation Corps to Region 4 of the Forest Service. The whole set-up will be used as originally planned, cooperatively by the Forest Service and the college without any fear of a possible transfer of the buildings.

Teaching facilities in the school were enhanced during the year by the establishment last July of the regional office of the U. S. Bureau of Fisheries. Dr. Stillman Wright, Regional Biologist in charge, has office and laboratory space in the Forestry building. This fisheries program, chiefly investigative, will be of considerable value to our whole program. Dr. Wright will assist with some of the classes and his work will, of course, include the part-time employment of some of the students.

The Forestry nursery has been continuing to grow and is looking for more ground to conquer.

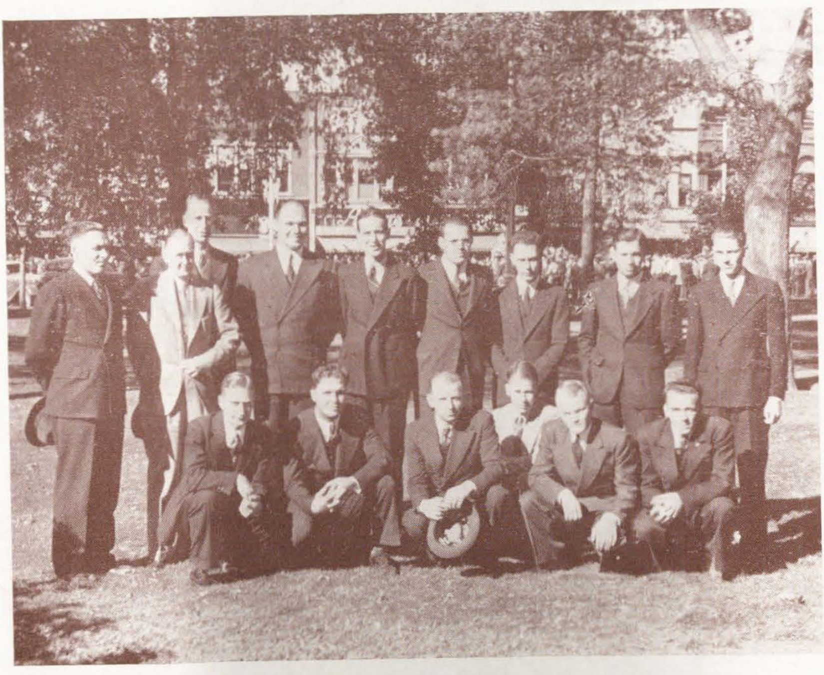
The first alumni meeting of the Foresters, which was held on the occasion of a breakfast at Homecoming, was quite successful and we all hope that this annual affair will be continued and will be placed on your fall program.

The employment situation was relatively good. During the past year over twenty of the men have received permanent employment, mostly on the basis of the 1937 examinations. However, we now have at least five men placed as C.C.C. camp educational advisors. Three graduates received scolarships for advanced work. Several others are also continuing this type of study. The apparent tendency of the federal services to incorporate more of their employees, permanent and part-time, under civil service regulations, is in general a good feature. The inauguration of the student-aid examinations for underclassmen which is contemplated, will be a step forward.

We receive word quite frequently from the field that you men are doing good work, and that you are a credit to the institution. This makes us feel very proud, and we hope that these reports will continue.

Don't get too busy to write occasionally, as we are always glad to hear from any of you and we will try to find time to give you a bit of the news. I will close with best wishes to all of you from the Forestry School faculty at Logan.

## GROUP ATTENDING FIRST ANNUAL HOMECOMING BREAKFAST



*First Row: Dunn, McLaughlin, Heywood, Snyder, Smith, Barnes, Redd, Gessel.*
*Second Row: Hansen, Rattle, Morse, Mason, Couch, Dargan, Scherbel.*

## ALUMNI DIRECTORY

1930

ADELBERT FAUSETT—Associate Range Examiner, U. S. F. S. Region 5, in charge of range surveys and studies. 760 Market St., San Francisco, California. Married, one child.

J. DELOY HANSEN—Associate Range Examiner, in charge of range surveys. U. S. F. S., Region 4. Ogden Utah. Married, two children.

1931

V. I. BENTLEY—Draftsman, U. S. Bur. Reclamation. 260 E. 4 N., Provo, Utah.

E. P. CLIFF—Associate Regional Forest Inspector, in charge wild life studies. U. S. F. S., Region 6. 4306 N. E. Mason St., Portland, Oregon. Married, one child.

W. L. HANSEN—District Forest Ranger. U. S. F. S., Caribou National Forest. Pocatello, Idaho. Married, one child.

C. P. STARR—Project Forester, U. S. S. C. S. Price, Utah. Married, no children.

MARRINER SWENSEN—Junior Forester, Flood Control Surveys. California Forest and Range Experiment Station. 402 N. Pasadena Ave., Glendora, Calif. Married, two children.

1932

OWEN DESPAIN—District Forest Ranger, U. S. F. S., LaSal National Forest. Moab, Utah. Married, one child.

D. M. EARL—District Forest Ranger. U. S. F. S., Kaibab National Forest. Kanab, Utah. Married, one child.

J. L. JACOBS—District Forest Ranger, U. S. F. S., Caribou National Forest. Idaho Falls, Idaho. Married, one child.

ODELL JULANDER—Instructor in Forestry, in charge of Range and Wildlife estry Dept., Iowa State College, Ames Iowa. Married, four children.

J. D. SCHOTT—Assistant Forester, project forester for Utah. U. S. S. C. S. 40 E. Miller Ave., Salt Lake City, Utah. Married, two children.

ALVIN STEED—Assistant Range Examiner, U. S. S. C. S. 409 N. Carlisle Ave., Albuquerque, New Mexico. Married, two children.

1933

W. S. ASTLE—District Forest Ranger. Powell National Forest. Escalante, Utah.

FRANK O. FONNESBECK—Ass't. Engineer Utah State Road Commission. Logan, Utah.

W. M. JOHNSON—Assistant Forest Ecologist. U. S. F. S., Rocky Mountain Forest and Range Experiment Station. Fort Collins, Colorado.

C. C. MICHAELS—Assistant Range Examiner. U. S. S. C. S. St. George, Utah. Married, two children.

C. S. THORNOCK—District Forest Ranger. U. S. F. S., Washakee National Forest. Dubois, Wyoming.

1934

R. C. ANDERSON—District Forest Ranger. U. S. F. S., Nevada National Forest. Box 231, Las Vegas, Nevada. Married, two children.

L. H. CARLSON—District Forest Ranger. U. S. F. S., Ashley National Forest. Manila, Utah. Married, no children.

MILTON SILL—District Forest Ranger. U. S. F. S., Boise National Forest. Atlanta, Idaho. Married, two children.

GORDON VAN BUREN—District Forest Ranger. U. S. F. S., White River National Forest. Yampa, Colorado.

1935

RUSSEL R. BEAN—Las Vegas, Nevada.

BASIL CRANE—District Forest Ranger, U. S. F. S., Humboldt National Forest, Elko, Nevada.

JOHN M. CROWL — Junior Forester, nursery superintendent. U. S. F. S., Gardner National Forest. Licking, Missouri. Married, three children.

ARDEN B. GUNDERSON—District Forest Ranger. U. S. F. S., Gallatin National Forest. Bozeman, Montana. Married, one child.

WALTER O. HANSON—District Forest Ranger. U. S. F. S., San Isabel National Forest. Moffat, Colorado. Not married.

FLOYD LARSON—Assistant Range Examiner. U. S. S. C. S., T. C. B. I. A. Rapid City, South Dakota. Married.

WAINE LARSON—Assistant Range Examiner, range surveys. U. S. D. G. 503 Federal Building, Salt Lake City, Utah. Married, one child.

ANDREW McCONKIE—District Forest Ranger. U. S. F. S., Salmon National Forest. Forney, Idaho. Married, no children.

LEGRAND OLSEN—Junior Range Examiner. U. S. F. S. Albuquerque, New Mexico.

JOHN D. REDD—Assistant Range Examiner. U. S. S. C. S. Moab, Utah.

M. R. STOCK—District Forest Ranger. U. S. F. S., Gallatin National Forest. Ennis, Montana. Married, one child.

1936

HORACE M. ANDREWS—Mt. Pleasant, Utah. Not married.

FRED R. BAUGH—Ass't. Ranger, U. S. F. S., Wyoming National Forest. Evanston, Wyoming. Not married.

ALDEN N. BREWER—District Forest Ranger. U. S. F. S., LaSal National Forest. Blanding, Utah. Married, no children.

LEWIS CLARK—Junior Forester. U. S. F. S., Uinta National Forest. Provo, Utah. Married, no children.

JOSEPH COUCH—Educational Advisor, C. C. C.

EDWIN ENGLAND—Box 1745, Hollywood, Calif.

RICH FINLINSON—C. C. C. Technical Foreman. U. S. F. S., Cache National Forest. Logan, Utah. Married, no children.

J. WHITNEY FLOYD—Assistant Professor of Forestry and Extension Forester. U. S. A. C. Logan, Utah. Married, three children.

PAUL A. GROSSENBACH—Junior Forester. U. S. F. S., Wasatch National Forest. Salt Lake City, Utah. Married, no children.

ALVIN C. HULL—Junior Range Examiner. Range Research U. S. F. S. Intermountain Forest and Range Experiment Station. Ogden, Utah. Married, one child.

JAY P. JONES—Spanish Fork, Utah.

MARK JONES—Educational Advisor C. C. C. Las Vegas, Nevada. Not married.

WALLACE MANNING — Recreational Planner. U. S. F. S., Uintah National Forest. Provo, Utah.

FERRIS McDERMAID—Junior Forester. U. S. F. S., Santa Fe National Forest. Glorieta, New Mexico.

LEONARD RAMPTON—Junior Forester. U. S. F. S., Malheur National Forest. John Day, Oregon. Married, one child.

LAMONT ROHWER—Junior Range Examiner, U. S. D. G. Box 101, Bishop, California.

ARTHUR D. SMITH—Assistant Professor of Range Management, U. S. A. C. Logan, Utah. Not married.

NATHAN SNYDER—Junior Range Examiner. U. S. F. S. Albuquerque, New Mexico. Not married.

VICTOR STOKES—District Forest Ranger. U. S. F. S., Wasatch National Forest. Pleasant Grove, Utah.

GEORGE SWAINSTON—Area Forester. U. S. S. C. S. Grand Junction, Colorado.

MONT SWENSON—Junior Range Examiner. U. S. S. C. S., Malad, Idaho.

JOHN TAGGART—Ogden Utah.

WILLIAM TOWNSEND — Educational Advisor, C. C. C.

BERT TUCKER—U. S. F. S., Burley, Idaho. Not married.

L. G. WOODS—District Forest Ranger. Afton, Wyoming. Married, no children. gan, Utah. Married, no children.

1937

LELAND F. ALLEN—Junior Range Examiner, range surveys. U. S. S. C. S., Albuquerque, New Mexico. Not married.

WAYNE ALLEN—Forest Ranger. U. S. F. S., San Bernardino, Calif.

LLOYD J. ASTLE—336 N. 1st East, Logan, Utah. Married, no children.

JACOB BERG — Assistant Nurseryman. U. S. F. S., Savenac, Montana.

MAX BRIDGE—Graduate Study U. S. A. C. School of Forestry, Logan, Utah.

VANCE DAY—Junior Range Examiner. U. S. S. C. S., Warren, Arizona. Not married.

FLOYD DORIUS—Ephraim, Utah. Married, one child.

DON DRUMOND — Graduate Study, Louisiana State College. Baton Rouge, Louisiana. Married, no children.

JOHN P. DRUMMOND — Graduate Study, Oregon State College. Corrallis, Oregon. Married, no children.

THERON GENAUX—Educational Advisor, C. C. C. Blanding, Utah. Not married.

RALPH K. GIERISCH—Junior Range Exaaminer. U. S. F. S., Rio Grand National Forest. Monte Vista, Colorado. Married, one child.

ANDERSON M. GRAY—Junior Biologist. U. S. S. C. S., New Albany, Mississippi. Not married.

LEE GRINER—Field Assistant U. S. Biol. S. Salt Lake City, Utah. Not married.

MARVIN HANSEN—Tremonton, Utah.

SHERMAN HANSEN—Biology Instructor Logan City Schools. Logan, Utah.

CLARK B. HARDY — Hinckley, Utah. Married, two children.

BRADFORD HATCH—343 Denver St., Salt Lake City, Utah. Married, no children.

ERNEST W. HENDERSON — Junior Range Examiner. U. S. S. C. S. Goldendale, Washington. Married, no children.

ROYCE D. HERMANSEN—Junior Range Examiner. U. S. S. C. S. Caliente, Nevada. Married, one child.

WILLIAM H. HIRST—Foreman, C. C. C. Milford, Utah. Married, one child.

ARTHUR E. HOLT—Ogden, Utah.

MAX S. JENSON—Junior Range Examiner, U. S. S. C. S. Lordsburg, New Mexico.

ELDORES S. JORGENSEN — Junior ange Examiner, U. S. S. C. S. Safford, Arizona.

JOHN F. KANE—U. S. Bur. Ento. Sacramento, California. Married, no children.

HENRY L. KETCHIE—Ogden, Utah.

GERARD J. LOMP—Graduate Study, Iowa State College. Ames, Iowa. Married, no children.

FRED LAVIN—Graduate Study. Univ. of Chicago. Chicago, Illinois.

CLYDE T. LOW—Junior Range Examiner. U. S. S. C. S., Price, Utah. Married, no children.

JESSOP B. LOW—Graduate Fellowship, Iowa State College, Ames, Iowa. Married, no children.

DOYLE S. LUND—Junior Range Examiner, U. S. S. C. S. St. George, Utah.

CLYDE R. MADSEN—Foreman, C. C. C. U. S. D. G. Reno, Nevada. Married, no children.

EARL J. McCRACKEN—2869 Washington Ave., Ogden, Utah. Married, two children.

LEO MOLLINET—Brigham City, Utah.

BLAINE C. MORSE — Junior Forester. U. S. S. C. S. Price, Utah. Married, four children.

CLIFFORD OVIATT — Junior Forester. U. S. F. S., Manistee National Forest. Baldwin, Michigan. Married, no children.

NEIL W. OWEN—U. S. D. A. Aerial Survey Laboratory. 1926 Lincoln Ave., Salt Lake City, Utah. Married, no children.

HOWARD B. PASSEY—Junior Range Examiner. U. S. S. C. S. Albuquerque, New Mexico. Married, no children.

SCOTT B. PASSEY—Junior Range Examiner. U. S. S. C. S., Mt. Pleasant, Utah. Married, one child.

JACK L. REVEAL—U. S. D. G. Reno, Nevada. Married, no children.

VERNON B. RICH—St. Charles, Idaho. Married.

JAY L. SEVY—District Forest Ranger. U. S. F. S., Nevada National Forest. Austin, Nevada. Married, one child.

WELDON O. SHEPHERD — Graduate Assistant, Agronomy Department, University of Nebraska, Lincoln, Nebraska.

EMERY SNYDER—Tooele, Utah.

WAYNE TRIBE—Ogden, Utah.

C. DOUGLAS WADSWORTH—District Forest Ranger. U. S. F. S., Wasatch National Forest. Hanna, Utah.

SYLVAN D. WARNER—District Forest Ranger. U. S. F. S., Nevada National Forest. Baker, Nevada. Married, two children.

ELDON M. WATSON — Educational Advisor. C. C. C. Delta, Utah. Married, two children.

KARL J. WILKINSON—District Forest Ranger, U. S. F. S. Jarbridge, Nevada.

ANTONE G. WINKLE—Junior Range Examiner, U. S. S. C. S. Pocatello, Idaho. Married, three children.

EVERETT C. WOŌD—Levan, Utah.

MILTON M. WRIGHT—C. C. C. Superintendent, U. S. F. S., Roosevelt National Forest. Fort Collins, Colorado. Married, one child.

HAROLD M. WYCOFF—Ogden, Utah.

1938

GLADE ALLRED—Farm Supervisor, A. A. A. Logan, Utah. Married, one child.

WARREN J. ALLRED—Afton, Wyoming. Married, one child.

NORMAN B. ANDREWS—Mt. Pleasant. Married.

THEO. E. ANHDER. Graduate Work, U. S. A. C. Hyrum, Utah. Not married.

HERBERT ARMSTRONG. Logan, Utah. Married.

SHELDON BELL. Tonopah, Nevada. Married, no children.

RAY BLLAIR—Foreman C. C. C. Mountain Home, Idaho. Married, no children.

HERMAN BLASER—Junior Range Examiner, U. S. S. C. S. Albuquerque, New Mexico. Married, one child.

VICTOR BUNDERSON — Graduate Work, U. S. A. C. Logan, Utah. Not married.

OLIVER CLFF—Graduate Study, U. S. A. C. Logan, Utah. Not married.

STERLE E. DALE—Protection, Kansas. Not married.

LUCAS DARGAN—Colorado Fish and Game Comm. Sapinero, Colorado. Not married.

RALPH DEMOISY—Paragon Printing Co. 150 North Main, Salt Lake City, Utah. Not married.

EVERETT DOMAN—Research Assistant, U. S. A. C., 669½ E. 5 North, Logan, Utah. Married, no children.

EUGENE DROWN—Graduate Study, U. of Montana. 413 E. Spruce St., Missoula, Montana. Married, no children.

GILBERT EGAN—966 Washington Ave., Ogden, Utah. Not married.

DON J. ELLISON—Graduate Study, U. S. A. C. Logan, Utah. Not married.

REVILO FULLER—Bechtel Con. Co. El Segundo, California. Not married.

HOMER GESSEL — Providence, Utah. Not married.

LYNN GRINER—B. S. '36, M. S. '38. Refuge Manager, Arrowhead Refuge. Kensal, North Dakota. Not married.

DOYLE HALES — Ogden, Utah. Not married.

FRED B. HARRIS—Graduate Study, U. S. A. C. Logan, Utah. Married, no children.

RICHARD HARRIS—Graduate Study, U. S. A. C. Logan, Utah. Not married.

WILLIAM S. HAYES—Pocatello, Idaho. Idaho. Married, one child.

BENJAMIN HEYWOOD—Junior Range Examiner, U. S. S. C. S. C. C. C. Camp 5 N, Espanola, New Mexico. Not married.

CLIFTON HOLLADAY — Santaquin, Utah. Not married.

WILLIAM D. HURST—Panguitch, Utah. Not married.

CYRIL L. JENSEN—129 W. 2 North, Logan, Utah. Married, no children.

EARL JEPPSON—Graduate Study U. S. A. C., Logan Utah. Not married.

MORRIS JOHNSON—Graduate Study, University of California. Berkeley, California. Not married.

DOUGLAS M. JONES—Nephi, Utah. Not married.

MORRIS LEWIS—Kamas, Utah. Married, no children.

CLAIR O. LUND—Brigham, Utah. Not married.

RAY E. McBRIDE—Pingree, Idaho. Not married.

LAWRENCE MATTHEWS — Grantsville, Utah. Not married.

JOSEPH MIR—Graduate Study, U. S. A. C. Logan, Utah. Not married.

MARCUS NELSON — Graduate Study, U. S. A. C. Logan, Utah. Not married.

RALPH NELSON—Smithfield, Utah. Not married.

MYRVIN NOBLE—Junior Range Examiner. Resettlment Administration. Tooele, Utah. Not married.

RHODELL OWENS—Graduate Study, New York State College of Forestry. Syracuse, New York. Not married.

CONWAY PARRY—Cedar City, Utah. Not married.

VIRGIL C. PETERSON — Graduate Study, U. S. A. C., Logan, Utah. Not married.

CHARLES B. PIERLE—District Forester, West Virginia Forestry Dept. Logan, West Virginia. Married, no children.

VAL RICHMAN — Sugar City, Idaho. Married, five children.

RAYMOND ROBERTS—Ogden, Utah. Married, no children.

GRAYDON ROBINSON — Range Examiner, Farm Security Adm. Malta, Montana. Married, no children.

FORREST ROMERO—McCammon, Idaho. Not married.

RICHARD ROYLANCE—Ogden, Utah. Not married.

HAROLD SCHOLES—Nursery Foreman, U. S. A. C., Logan, Utah. Married, two children.

MARK SHIPLEY—Junior Range Examiner, Nevada Agricultural Experiment Station. Reno, Nevada. Married, one child.

ROY SHIPLEY—Junior Range Examiner, U. S. S. C. S. Albuquerque, New Mexico. Married, one child.

AARON SPEAR—963 W. 2 N., Salt Lake City, Utah. Not married.

DONALD SPIERS—Graduate Study, U. S. A. C., Logan, Utah. Married, three Children.

VICTOR SURFACE—Project Supervisor, U. S. S. C. S. Tooele, Utah. Married, no children.

REED THOMPSON—Teton, Idaho. Not married.

DAYL WEBB—Richmond, Utah. Married, no children.