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The Purpose of this journal is to provide a medium of contact between our school, other forestry schools, our alumni, and all those interested in the profession of forestry.
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MULTIPLE-USE FORESTRY

The Ames Forester of 1951, as in past years, reflects current trends in the use of our forests. Until recently, the only recognized product of timberlands was wood. As our country and its leaders have matured, less obvious values have become recognized. Today those additional values—soil, water, wildlife, and recreation—are integrated with wood production into the concept of multiple-use management. In this issue we attempt to focus attention on this multiple-use of our forests.
The fact that a forestry organization is interested in the subject of wildlife management and multiple-use forestry is testimony, if any were needed, to the advanced thinking that has developed since the time when forest and forestry management were widely regarded as important solely for the production of saw logs. It is indicative of clearer understanding of the basic interrelationships that exist in managing natural resources.

America has many types of forest. It likewise has many kinds of forest wildlife and fish whose continued existence depend upon the presence of suitable forest habitat. Historically, the management of game and forests have long been united in Europe. Multiple-use forestry, as practiced in some countries, is much more intensive than anything yet developed in this country. This statement applies both to the management and to the harvesting of timber, wildlife, and other forest products.

Others have been assigned the subjects of recreation, soil conservation, watershed protection, and European multiple-use forestry. These phases are so closely related that it is difficult to treat one without intruding to some extent on that of other phases. This discussion will, however, try to point out the wildlife management concepts which must be integrated in the primary forestry program if wildlife is to take its proper place in multiple-use forestry management.

The success of any attempt to integrate wildlife and forestry administration will depend to some extent on the primary purpose for which the forest is to be managed. For example, on the White River Waterfowl Refuge in Arkansas, the principal duck food produced on much of this land is acorns. Since the area is primarily managed to produce winter food for waterfowl, the long-time timber management program is planned to secure greatest possible annual production of acorns. This may or may not be good forestry. Some other management might be more advantageous if the forest were to be handled to produce the greatest annual value in lumber. Similarly, upland forest lands managed primarily for wildlife purposes might be handled so as to keep as much as possible of the area in young second growth stages. Again this might or might not be good forestry.

If these same lands were to be managed for the greatest possible production of saw logs, the management programs might...
easily be reversed. On the White River area, management might well be directed toward the production of the most valuable trees according to present commercial uses, and toward keeping as much of the units as possible in the production of harvestable timber. There are, therefore, elements of conflict between the two goals of management. The concept of multiple-use forestry carries the implication that management will not be based on one use but will develop by coordinating into the program practices that will produce the greatest combined values. Even under such a concept the primary purpose for which the land is administered will have a vital and important bearing upon the extent to which other resources can be maintained and utilized.

Before going further in this discussion, it should be pointed out that wildlife is a natural resource, owned by the public and dedicated to citizen use. It should, therefore, have an especially strong claim to consideration on all publicly owned lands. On the other hand, wildlife, while having public values, also creates problems which at times make administration difficult. In a limited discussion, it is not possible to go into considerable detail, but some of the problems created for forest management by wildlife species can be mentioned. Perhaps the most spectacular has been the effect of over-browsing by big game animals and by livestock on some of the forest lands, particularly in the more arid forest districts. Overpopulations and overutilization by either or both in combination can in the long run be destructive to the forests as well as to the browsing species themselves.

Overgrazing by wild or domestic animals, another phase of this same problem which cuts the grazing productivity of the land besides, increases flash-run-offs and causes destructive soil erosion. When the destructive effects of grazing or browsing are mentioned, most individuals think of the arid western lands. Yet, there have been similar problems in many eastern forests. Studies at the Coweeta Forest Experiment Station in North Carolina of the effect of various land practices upon forest growth and upon run-off have indicated that grazing, even on a moderate scale, can often have disastrous effects upon the future productivity of these forest lands and increase flash run-off more than other intensive uses.

Another wildlife activity that creates problems for administrative foresters is the retarding effect upon reforestation that birds and mammals may have. This includes not only the consumption of the seeds but the destruction of seedlings by some species. As an offset to this detrimental effect, some of the same species may act as forest planters by burying or storing seeds that are never recovered or utilized.

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While the effect of beaver activity is generally classed as beneficial in mountainous forest lands, they may not be so considered in slow moving waters. Both dam building and feeding habits affect forest management to some extent.

Another much discussed relationship of wildlife to forest management is the scattering of more or less undesirable plants, such as poison ivy in some eastern forest lands. Wildlife has also been accused of spreading tree diseases and on occasion diseases of domestic animals without as yet any very convincing evidence to support such claims.

Wildlife has values to forestry also. In this category can be placed the repressive effects of insect eating species on destructive insects. This repressive effect is one of the normal, natural checks upon abnormal increases of species, and probably from available information is most effective when insect populations are low rather than at the time they are approaching plague proportions.

Another value of wildlife in the management of forests is the fact that it often provides for the utilization of food supplies that would not otherwise be used for any purpose. It has been pointed out repeatedly by students of range and range conditions that too great populations of domestic stock or of big game can have a detrimental effect upon the forest. It has been also pointed out that each type of injury has characteristics which make it possible to determine the factor largely responsible, if populations of both forms are present and that the game species, even on a range that is used to capacity by domestic stock, do utilize some plants that are not palatable to such animals. Therefore, the presence of big game and other wildlife is an added value which increases the total productivity.

Beaver have been mentioned among the species that create problems; beaver also have values in forest management, particularly in the steeper forest lands where beaver dams and beaver meadows have provided storage and regulation of run-off water to the advantage of both forests and the lands below.

The major value of fish and wildlife on the forest lands is the production of added public values by providing for a public resource that would not otherwise be available. It is impossible to place an evaluation on these resources. Although the values of commercial fisheries can be estimated by using the marketing returns, fish and game as a recreational resource to be utilized by the public is not so easily measured. While it might be possible to arrive at some sort of an estimate of the meat value of the fish and game taken, no monetary estimate can be placed on the aesthetic and recreational values.
Production of a wildlife or a fish crop also has a direct benefit to the forestry program in addition to its value in itself. The cooperative wildlife program on the George Washington and Jefferson National Forest in Virginia, for example, which started with an area almost devoid of game has built it into a first-class deer area. The success of this program has brought about wholesome reactions to and support for other necessary forest management programs.

Similarly, scattered projects, such as the development of new fishing waters by the planting of lakes previously devoid of fish, by the restoration of streams that have deteriorated for any reason, the development of management concepts on forest lands as applied to various sorts of fishery resources, have contributed directly to a greater public interest in the forests and certainly have not been disadvantageous to the forestry resources, despite the fact that the presence of great numbers of fishermen and hunters often provide some headaches for the administrator.

The effects of wildlife upon forestry and forest management having been outlined briefly, it might be well to turn the tables and discuss the effect of forestry practices upon wildlife and fishery production. Building of access roads to areas which were formerly so remote as to furnish reserve stocks of game and of fish for restoration purposes directly and usually adversely affect the wildlife resource. This fact has been recognized by the establishment of wilderness areas at least partially as an effort to preserve some areas as reservoirs of wildlife.

Building of roads has a more direct and immediate effect upon fish and fishing resources, particularly in smaller streams. The practice of building roads close to stream beds not only permits access of so many fishermen as to quickly reduce the productivity of the stream, but it also often provides so much erosion and excess silt as to reduce or destroy the future production.

Another practice which may be detrimental to wildlife is excessive timber stand improvement. Little work of this kind has been carried on in recent years, but when practiced the evil effects may be by destroying of den trees for furbearing mammals which needs no elaboration, and the reduction of food producing trees and shrubs by work designed to favor one or few species of trees over those classed as “weed” trees. Weed trees seem to be those for which there is no great demand in present markets. It should be pointed out that both markets and uses are relatively temporary factors. New developments, new inventions, new concepts are constantly changing the market, decreasing the value of some natural products and enhancing the values of others. It is not safe
to predict that any particular forest tree or group of trees will be of greater or less value in the future than it is at present.

Another practice which adversely affects wildlife to the extent that it is successful is the effort to reproduce pure stands of one type of trees. The replanting program has naturally used coniferous planting stock due to the relative ease with which seed can be collected, grown, handled, and shipped as compared with the more difficult task of producing quantities of deciduous trees of equal value. Pure stands reduce both food and cover value.
for wildlife, particularly when they are extensive. Small pure stands of conifers provide good escape cover and good winter cover for many varieties of wildlife, but little food except for specialized groups. While pine mast is utilized by many wildlife species, production is frequently too uncertain and too variable to provide a dependable source of food supply for a large wildlife population. Observations and studies generally indicate that mixed forests provide more values to a greater variety of life.

The development of large areas of cut-over land, mature stands of timber, and other age classes, or attempting to do so, also tends to reduce the wildlife production over a period of years. In many forest types the greatest value for many forms of wildlife are present in the part of the forest cycle between cutting or burning and a forest old enough to close the canopy. Management in large blocks or no management which often tends in the same direction is apt to be followed by violent swings in numbers of wildlife populations.

Another practice which deserves emphasis is the natural tendency to plant solidly all natural glades and openings. It is axiomatic that the greatest variety of wildlife find the greatest variety of food and cover that are suitable for their use in and about the edges of such openings. Planting all such areas will reduce the potential wildlife production.

There has been much discussion of the integration of wildlife and forestry programs, but as a matter of fact, there are relatively few wildlife species about which enough is known to outline a program. Such knowledge is available to a degree for deer, elk, turkey, and grouse. Many practices known to be beneficial from a wildlife standpoint, are not yet economically possible in an extensive rather than intensive forestry management program. Undoubtedly some of the successful practices on European forests modified to meet American conditions would work equally well in some of our forests if the manpower and money were available to put them into effect. But economic considerations limit their usefulness even as similar considerations limit the extent to which forest management concepts can be applied.

On the other hand, there are forest management activities that are helpful to wildlife. Three concepts of forestry management that are becoming more widely accepted are of decided advantage to the maintenance of wildlife populations on forest lands. Probably the most important has been the increasing interest in the multiple-use concept itself in the minds of foresters and of the general public. While a complete multiple-use forest management has not yet been placed in operation on any great proportion of forest lands, the concept itself is a recognition of the fact
Wildlife students are generally agreed that the best part of the forest cycle for deer is in the earlier years of reforestation.

that other than timber values should be considered in the management program of the forests. The fact that wildlife did not receive a greater consideration in the past is probably as much the fault of wildlife interests as it is of the foresters. Until recently few wildlife students had much knowledge of forestry problems or of management practices beneficial to wildlife populations on forests. An intelligent program requires not only knowledge but trained men in both fields to develop management programs that are truly multiple use for these two resources. Wherever other resources enter into consideration, the problem becomes even more complicated, and such knowledge as is available is of comparatively recent development.

Another concept which contributes to the potential wildlife values of forest lands is sustained yield as contrasted with the cut-out and get-out type of forestry that is still too largely practiced. Sustained yield means that the land will be so managed that the forest restores itself at a rate equivalent to the harvest. In formulating a harvesting program a policy of cutting in units as
small as is economically possible will provide a greater variety of wildlife cover and food in a smaller area. To the extent that it is placed into effect on forest lands, sustained yield management, if coupled with a small area concept, should have a tendency toward holding browsing wildlife species somewhat below the populations that precede disastrous overbrowsing and undoubtedly considerably below the point desired by the more rabid of the outdoor fraternity. It would also tend to maintain somewhat higher numbers than those present in the years following great reductions in game populations.

The sustained yield idea also carries, at least by implication, the thought of maintaining vegetative cover and to the extent that it succeeds, it will help regulate the flow of streams and in turn help fish populations.

A third idea of considerable value to some forms of wildlife is the increasing emphasis on the watershed protection values of forests. The growing concern over excessive soil erosion and the resulting silting of streams has quickened the interest in water problems on the headwater streams. The growing human demand for water undoubtedly will intensify that interest and make more important than ever the protection of watersheds and watershed run-off.

The first need of a watershed area is vegetation. If possible, it should be vegetation valuable for timber production and for sustaining wildlife, but any vegetation is preferable to none in heavily eroded areas.

All of the renewed emphasis on the basic ideas are to the advantage of wildlife. In translating such thinking into actual practices, management should contain both men trained in forestry and in basic wildlife biology. If both types of knowledge can be found in one man that is still better. It is on this type of management that multiple-use management, if it is to be really effective must rely since it will inevitably mean a series of compromises in management policies and practices. This can only be accomplished where both knowledge of the needs of various resources and an interest in their welfare is present. If these qualities are actually present, some management techniques can be modified to help the wildlife resource without undue harm to forestry values.

It must be recognized, however, that with present knowledge, it is impossible to outline projects which will help all wildlife species that exist in any area. As an example, wildlife students are generally agreed that the best part of the forest cycle for deer is in the earlier years of reforestation. On the other hand, such information as is available indicates clearly that turkeys are better
suited by a more mature forest. Therefore, it is difficult if not impossible to develop in restricted areas optimum conditions for both species. As a matter of fact, the accidents of slope, location, soil, and site, will produce enough variety in the average large block of forest land to provide potential or actual habitat for both, although not ideal conditions for either. Therefore, in outlining a management program which includes wildlife it must apply specific practices, knowing that the result will be to benefit some kinds of wildlife and perhaps to harm others. Each wildlife species has its own requirements as to cover and food, which often cannot be made available for all on limited areas.

Even with the best possible management it is obvious that not all forest units can produce a maximum population of any wildlife species any more than the same area can produce a maximum timber crop. The most that management can do is to secure as near the potential production as is possible under the natural limitations with the funds and man power available.

Mixed stands are obviously more favorable for wildlife than pure ones for the simple reason that a greater variety of food and cover are to be found in such forests. There is also a growing belief that striving for mixed stands is better forest management. Because forests when they are in the seedling brush and young tree stage are most valuable for certain wildlife, such as deer, elk, and rabbits, the distribution and size and cutting units affects the character and extent of wildlife populations.

Thinning of forests also benefits wildlife. Trees in thinned areas produce earlier and larger crops of seeds, and the opening up of the forest permits the earlier development and greater growth of browse and other food producing plants.

Breaking up of large areas of dense stands of conifers and preservation of natural glades are also an advantage to wildlife. Creating artificial glades and openings, while often of considerable wildlife value, is generally too expensive unless such openings or clearings have enough added values for fire protection or other forest management efforts to justify it. The planning of cutting operations in such a way as to leave a margin of trees along streams that provide good fishing and management practices that keep the accumulated debris from logging operations out of streams are also techniques that have wildlife values.

This is perhaps a negative approach, and yet, anyone who has seen the complete destruction of valuable trout or salmon water following logging operations has little doubt as to the value of a properly planned and managed cutting. Modification of timber stand improvement practices to prevent the destruction of den trees or the loss of a large part of the species that furnish browse, fruit,
The character of the vegetative cover determines the size of the rabbit population.

or seeds for wildlife is also important wherever timber stand improvement work is done. Actual release cuttings for important units of cover or food producing plants sometimes has great value in critical areas, but such activities on a large scale are usually economically impossible. Such practices are sometimes used on lands managed primarily for wildlife and to the extent that they can be fitted into the management program, they can equally be valuable on other land.

None of these suggested practices if used with judgment
would have any deleterious effect upon forestry programs. In fact, many of them can be directly correlated with good forest management. To use them requires good judgment both in planning and operating management programs.

There is little question that more intensive management of forest lands is coming. The growing human populations and the growing human demands upon land for other purposes will help stimulate greater production of all natural resources on lands that are not intensively used for other purposes. Such management will cost more whether it is calculated in terms of cost per acre or in percentage of the value of the product.

While this country will not soon attain the intensive utilization of all natural crops from its soils and waters that prevails in parts of the Old World, the tendency is definitely in that direction. It will undoubtedly continue as long as a growing human population supplies the impetus. It is entirely probable that management will become more a professional opportunity and a professional responsibility. This is inevitable since the application of practices that will result in actual multiple-use forestry will require clear understanding of the many fundamental factors that affect natural resources and of the practical results that can be secured. More accurate knowledge and more precise techniques will be needed, and these are most likely to be provided by well-trained men.

The greatest present obstacle to the application of present information is the comparatively limited background and training of these men who must formulate a program and sell it to the public. Less highly specialized technicians with broader backgrounds will almost surely be developed to handle this assignment. This will provide a challenge to all who are generally interested.

That multiple-use forestry will work to the advantage of both forests and wildlife has been amply demonstrated on relatively small areas in many sections. The present practices that are economically feasible can be applied as fast as programs can be formulated and sold.

ABOUT THE AUTHOR

Dr. Gabrielson is now President of the Wildlife Management Institute—an office he has held since 1946. He was associated with the Bureau of Biological Survey for many years, serving as Chief from 1933 to 1940. Dr. Gabrielson was Director of United States Fish and Wildlife Service from 1940 to 1946.

Among our author’s books are Western American Alpines, 1932; Birds of Oregon, 1940 with S. G. Jewett; Wildlife Conservation, 1941; and Wildlife Refuges, 1943. Dr. Gabrielson was editor of The Fishermen’s Encyclopedia, 1950.

Dr. Gabrielson, a native Iowan, received his B.A. from Morningside College in Sioux City in 1912 and the degree of Hon. D. Sc. in 1936 from Oregon State College.

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Few people would disagree with the principles of multiple use management of the national forests. It is just common sense to put public lands to their highest public use and to utilize all of the resources, so long as the land is protected and its stability and productiveness are preserved.

The application of the principles of multiple use management, however, involves many decisions. Experienced men frequently disagree as to whether a particular use is the highest use or whether a combination of uses will yield the greatest public return.

In dealing with recreation values in multiple use management of forest land we must deal with tangible and intangible values. We must recognize a monetary value for such things as fishing, camping, sight-seeing, and wilderness, and at the same time we must steadfastly maintain that no one can put a dollar sign in front of a rainbow. Above all, we must realize that in good multiple use management it is possible for a combination of uses to yield a greater public value than any one use can yield. For instance, one-half of the recreation resource of an area plus one-half the timber resource may have greater public value than either of those resources alone.

Now, let's get down to cases. Let's take a look at the Pine River drainage—which could be any one of a hundred western river drainages. The headwaters are mountainous national forest land at 8,12,000 feet elevation; clear streams come down from a well-managed watershed and form the Pine River which runs into a 2,000-acre irrigation and power reservoir with spillway crest at 7,000' and a possible drawdown of 50'. The Pine River runs below the dam for 20 miles before breaking out into a hot, dry, fertile valley. There are some 85,000 acres in this drainage. A major U. S. highway runs up Pine River and along the west bank of the reservoir, and then crosses, through a low pass at timberline, into another drainage. Secondary roads make half of the shore line of the reservoir accessible for recreation use and resource utilization.

There are 40,000 acres of well-stocked timberland with 800 million bd. feet of fine timber, from which the annual allowable cut is 10 million bd. feet.

Some 50,000 acres of the land in the drainage are also suitable for grazing domestic livestock and yield 5,000 animal months.
What is a day’s camping and fishing worth? Ask these people and you'll be astounded at the value.

of grazing without damage to the forage or the watershed. The drainage also supports a game population of 250 elk, 500 deer, and 75 black bear, which are hunted according to State law.

For recreation use there are camp and picnic areas, resorts, cabin camps, organization camps, boat docks, trails, summer homes and very attractive roads to drive on. The roadside zones along the U. S. highway and the major secondary roads are reserved for 200' on each side. Pleasure driving is a popular pastime for the residents of the lower country where it's hot and dry. The fishing waters consist of the reservoir, some 25 miles of streams flowing into it, and 20 miles of Pine River below the dam. Rainbow and cutthroat are the principal game fish which lure the fisherman to these waters.

The areas between the river and highway and between the reservoir and the major roads are managed primarily for recreation use or scenic values. Altogether about 4,000 acres are thus classified and recreation, present and future, is the top priority use, but only about 500 acres are actually developed for recreation use; the rest is maintained for scenic and environmental values and for future use. At the upper end of the reservoir some 10,000

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acres, mostly rough, high country, are part of a large wilderness area which extends over the divide into another drainage. In this area primitive conditions of habitation and environment are preserved. There are no roads, no timber cutting, no developed recreation areas.

Now, let's set forth some of the values which this 85,000-acre Pine River drainage produces annually, under good multiple use management, as a national forest.

Timber—annual allowable cut from
800 million bd. ft. on 40,000 acres . . 10 million B.F
average value on the stump of the annual cut at $9.00 per M .................... $90,000.00

Water—annual runoff—usable 80,000 acre feet
irrigation—value at $3.00 per acre feet ........... $240,000
power—value at $1.50 per acre foot ............... 120,000

Total value of water for irrigation and power ........ $360,000

Grazing 5,000 animal months
Value at 50 cents per animal month ............ $ 2,500

Recreation, annual
Camping and picnicking ............... 20,000 man-days' use
Boating and swimming ............... 10,000 man-days' use
Resorts and summer homes ........... 5,000 man-days' use
Organization camps ................ 6,000 man-days' use
Hunting and fishing .................. 15,000 man-days' use
Skiing, winter use ................... 25,000 man-days' use
Sightseeing trips along roads ........ 10,000 man-days' use

Total .................................. 91,000 man-days' use

What about the value of the 91,000 man-days of recreation use, which are competing for some of this timber, worth $9.00 per M on the stump and are dependent upon a reservoir well full of water worth $4.50 per acre foot?

We know that people are very willing to spend money on the transportation, lodging, meals and equipment necessary to spend time at Pine River and enjoy the forest recreation to be found there. Some studies show that the costs per person are $10.00 per day, but that of course is only a minimum value of the recreation. It is safe to say that the recreation is worth at least that much, because if it wasn't, people wouldn't spend money to go there. That value, however, is far from the full measure of the spiritual and physical welfare which the recreationist gains. Even so, look what value $10 per day gives to these 91,000 man-days of recreation use. We will come back to this discussion later.

Now, let's go to Pine River and see what conflicts and

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problems have faced the forest supervisor and forest ranger who have been managing the area—and what modifications in the management of all resources have been necessary in order to give recreation its proper place in the multiple-use picture. In this discussion we will deal with recreation, but it should be remembered that multiple use as practiced by the Forest Service means that the highest public value of the land is developed. In some places, for instance, part of the recreation value of land must be sacrificed so that the land may produce the highest volume of timber, per acre per year, in order to supply the tremendous quantities of lumber and wood products which are needed to keep the United States strong and prosperous.

Photo. U. S. Forest Service.

Pine Creek below the dam has great recreation value.
As you ride along the U. S. highway you see a forest of mature trees in the roadside and water-front zones. It will not be cut except on a salvage or sanitation basis. Many of these trees are no longer putting on good growth—they are silviculturally ripe and some are dying. As you ponder this problem you pass a crowded picnic area between the highway and the river. Many people are enjoying a forest outing under this mature timber. You pass tourists along the road who are obviously admiring the scenery. A forester knows that those rugged looking veterans are not paying their way in board feet per acre per year, but the tourist doesn't know that and he enjoys seeing them—even if they have big cat-faces and are spike-topped and many of the dead limbs show sure signs of rot. You make some mental calculations—the roadside zone plus the area between the road and the river will average 10 chains—that's 80 acres per mile. This particular land ought to be growing 250 board feet per acre per year. At $12.00 stumpage for this particularly accessible timber, that's $240 per mile per year and the Supervisor said there were 30 miles of road and shore line—that's $7,200 a year. If 40,000 people travel the highway in a year and enjoy a couple of hour's drive and campers and picnickers use the area 20,000 man-days per year—well let's wait and see. However, you have seen enough to agree that the roadside and water-front timber is worth a great deal for recreation—probably more than for lumber in a nation with plenty of resources. Let's hope we manage our lands so that the United States can always enjoy the luxury of leaving $12.00 timber for our people to look at, relax under, and enjoy. A poor nation, poor in resources and land, certainly could not afford this. Neither could its people afford automobiles, refrigerators, television sets. Well-managed resources and sound forest management are prerequisites of a prosperous, strong nation.

Then you come up over a ridge and there lies the reservoir. A beautiful sight with its timbered shores and the rugged peaks in the background. As you get closer your practiced eye sees that the water level is about 15 feet below high-water mark, but that isn't bad for mid-August, and judging by the number of boats you see it hasn't hurt the fishing either or the pleasure boating. The water is roaring out of the power house below and you suddenly remember that the Pine River was flowing full below the dam and that you saw many fishermen as you drove up the river and were thinking about the timber in the roadside zone. Pine River wouldn't be that big a stream at this time of the year if water wasn't stored in Pine reservoir during the Spring runoff and let out during the dry summer months.

You stop for lunch at the resort a couple of miles above
the dam, commanding a grand view of the reservoir and the high country beyond. The place is well filled with day and vacation guests. The owner joins you and talks with the supervisor about his special use permit for which he pays the United States a small percentage of his net sales, for use of the land. He owns the buildings and operates the place, and the Forest Service requires only that he keep the place in good order and provide needed accommodations and services for the public at reasonable prices.

Business is good—the weather has been favorable and the water users have been able to keep the drawdown to a minimum. That makes you wonder again. What is an acre foot of water in Pine River reservoir worth? First it is used for fishing, boating, and swimming in the reservoir and enjoyed by people camping and picnicking on the shores; then it produces kilowatts in the power plant; then it runs down Pine River for 20 miles and is very fine recreation and fishing water; then it is diverted into irrigation canals and grows crops in the valley. That's multiple use to the nth power, especially if you remember that the snow which produced much of that water was skied on by thousands during the winter. Two thousand acres of reservoir, average depth 45'—that's 90,000 acre feet, of which 80,000 acre feet are usable. An acre foot of water at Pine River reservoir with a 200' head is worth $1.50 for power, and later on the same water is worth $3.00 for irrigation. So each acre foot is worth about $4.50, plus the fishing and recreation values which you can't exactly figure in dollars and cents but you know it is a high value. And you can't forget that the Pine River drainage wouldn't produce 80,000 acre feet of usable water if the watershed were not properly managed.

The resort owner tells of former controversy. At one time the drawdown reached 40' by August 1 and the fishing and boating were very poor. Wide mud flats spoiled the recreation and the people from the hot, fertile valley raised—something besides crops. A study was made of the irrigation and power requirement as against the recreation needs. The water users discovered that they could get along on less water during July and August in normal years by better methods of irrigation and the power could be developed later in the season without much loss of revenue. It was also shown that because of the topography of the reservoir—a 20' drop would not be objectionable from a recreation standpoint except at the upper end of the reservoir. As a result, recreation areas were placed in locations where drawdown was least noticeable, more efficient irrigation was practiced, some marginal lands were taken out of cultivation, a new power hook-up was devised, and it was agreed that the drawdown would be held to 20' or less until after Labor Day. So the people from the valley,
many of them water users, had enough irrigation water and enough power and they had recreation during July and August when they really needed it.

That afternoon you saw the timber sales areas where sustained yield cutting and logging were being done very skillfully in order to prevent unnecessary erosion which would silt up the reservoir and shorten its useful life. Marking was not based on the silvicultural needs of the stand alone. The size of the openings permitted and the selection of species were partially dictated by the necessity of maintaining a good cover on the watershed. Special attention was also given to improving the wildlife habitat.

Logging trucks did not travel the busy U. S. highway on week ends and holidays in order to avoid the danger and inconvenience of mixing with the large recreation travel. The forest was in excellent shape and the logging operator was making a satisfactory profit. Multiple use was working for the general public welfare.

A half day's horseback trip showed you some trails and range land. The cattle and sheep on the Pine River area looked good and so did the forage. You might have thought that too much forage was left until you remembered that some of the deer and elk
had to winter there as well as share some of the summer feed with domestic livestock. And also there was that valuable reservoir and no chances could be taken on erosion from overgrazing by livestock or wild game.

Riding along the trail up Big Creek you met several parties from the resort out for a ride, and a pack string coming back from a week's trip in the wilderness. People and livestock were both using this area. The trail was pleasant and the occasional cattle seen were interesting. The rustic trail direction signs were most attractive and appropriate. Fat cattle and happy people suggested that the supervisor was doing a "bang-up" job of multiple use management.

A trip towards the upper end of the reservoir revealed that the supervisor was doing a good job of watershed management. The creeks coming down from the timber sale areas and the grazing allotments were clear despite a heavy shower the day before. Then you noticed a change. The Deer Creek arm of the reservoir was muddy and Deer Creek was full of silt and there were no fishermen there. The supervisor was frankly disturbed and explained that a small placer mining operation was working some placer ground up Deer Creek. The supervisor had figures to show that the value of gold taken out was small and probably less than the loss of public fishing value and the damage to to reservoir by silting which was estimated to shorten its useful life by many years. The supervisor spoke hopefully of future changes in the mining laws which might prevent a mining operation from damaging public values.

Then you looked across the reservoir into the wilderness area where there were no roads and no timber sales—nothing but primitive conditions for the enjoyment of wilderness people. There were some patches of good timber, but most of it was high country—subalpine and noncommercial types. You remembered that wilderness is a scarce resource, that there is not much left in the United States and if we are to have any for future generations to explore and enjoy, it must be preserved now because once invaded, an area cannot be made wilderness again.

On a side road you passed several organization camps where young people from the local communities and distant cities were having a wonderful forest vacation. Some of these were children who had to have assistance to enjoy an outing. Local civic and church organizations sponsored these vacations and made it possible for these children to get a wonderful two weeks in the forest. The camp was also under special use permit, but, because of the semi-public character of the operation, the fee was a nominal $25 per year for 20 acres.

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A summer home fits into the forest and yields a good return in enjoyment from land not suitable for public use.

The summer home groups emphasized land value from another angle. One was on a rocky ridge overlooking the reservoir which was about 500 yards distant. There were 30 attractive cabins, which fit into the topography and the cover. The forest environment was pretty well preserved by skillful lot layout and careful selection of building design and color schemes. These were private cabins built on national forest land under special use permit. The lots were about one-half acre in size and the owners paid the United States $35 per year and built their own cabins and paid for the maintenance of the access road—$50 per acre per year, figuring the space between lots and the buffer zone. Timber growth on that rocky ridge would hardly be 75 bd. ft. per acre per year. That was good business, and these private uses were located so that there was no interference with public uses which, of course, had first priority.

Recreation in the multiple-use picture is just an integral part of forest management. The highest public use of a particular area may be a single use or a combination of uses. There is no formula—each case must be decided by trained and experienced foresters who know the resources of the land, what it is capable of

*Photo. U. S. Forest Service.*
producing under skilful management, and what the public needs are. The Pine River reservoir water is a fine example. The first 20 feet or about 30,000 acre feet could be drawn off with only minor detriment to the recreation value. These 30,000 acre feet could also satisfy the minimum requirements of agriculture and power. Clearly, the highest use of this water is for irrigation and power. Every additional foot of drawdown does real damage to the recreation values (until after September 10) and is of greater importance for public recreation. Hence the land managers and the owners of the water decide that the top 20’ of the reservoir is principally valuable for irrigation and power—the rest is principally valuable for recreation until September 10; thereafter it becomes more valuable for power and irrigation again, except that the last 10,000 acre feet has to be kept in the reservoir and flowing in lower Pine River to preserve the fish life, and is most valuable for fish propagation.

It is the objective of the Forest Service to manage all national forests for the greatest net public benefit, but unfortunately there are often more complications than the Pine River area illustrates. Federal and State land managers are not always free to decide all issues on public values alone. Certain laws applicable to public lands are in need of careful revision. The mining laws are an example. Mineral deposits are often the highest use of a particular area, but that should be decided by a consideration of all values—not as is the case now, by arbitrary right to take minerals irrespective of other values and possibly to the accompaniment of destruction of public values greater than the mineral values. There are intermingled private lands in most national forests which make good land use more difficult. Water rights are often privately owned and cannot be used for their highest public purposes. These things make the supervisor’s job more difficult, but in time public opinion will bring about desirable changes and better land use.

We can’t leave this problem without asking—and attempting to answer the question: What is the public value of the recreation use in the Pine River drainage? Is $10.00 per day a fair valuation of the recreation? Who knows? Ask the business man in the near-by city what the week end he plans to spend in Pine River is worth. Ask the family which is going there for a picnic and a swim. Ask the fisherman who thinks about Pine River’s fast water all week, and who will grossly exaggerate what he caught there all the following week. Ask the people who spend a vacation riding in the wilderness area or staying at the resort or at summer homes. Ask the townsfolk who drive up to the reservoir every time they have guests. Ask anyone who enjoys the
Pine River recreation opportunities and you'll soon find out that the values are so great that they stagger your imagination.

This presents a difficult problem and one which can't be solved by mathematics or statistics. It goes back to basic human needs for recreation and relaxation. What is a day's fishing, hunting, picnicking or boating worth? Like all other values—supply and demand affect this value but human need and desire really set the price. Yet we must face the practical facts—a million board feet of timber in a good accessible location has a definite market price at a given moment; an acre foot of water 200' above a power plant can be sold for cash and sold again to a farmer for irrigation. A man-day of recreation, dependent upon board feet of timber in the form of standing trees along a well filled reservoir, is competing for resources which have a definite cash value, and no one can put a cash value on it. Yet it's there—it is one of those things which needs no proof—people just know it and feel it. That's why large cities have parks which could be subdivided into business lots and sold for millions—but no one would do it. Recreation is a human need which must be provided, if man is to live and be happy. When life and happiness are at stake—other values, no matter how large, become small in comparison.

So there is a sound logical and biological basis for asserting that recreation has great value and that in certain instances it overshadows most other values—and yet you can't put a dollar sign in front of it.

OUR AUTHOR

John Sieker is a graduate of Princeton University and the Yale School of Forestry. He entered the Forest Service in 1926 as a forest ranger. He later served as assistant forest supervisor of the Harney National Forest and as supervisor of the Shoshone National Forest. He is now chief of the Division of Recreation and Lands, a position he has held since 1938.
Multiple-Use of Forestry in Switzerland
RUDOLPH STAHELIN

WHEN I was invited to write a short article on multiple use forestry in Switzerland, I was at first somewhat bewildered. The term multiple use forestry, as applied to the general policy of the administration of our National Forests, is not found in its equivalent, in any of the four official languages of Switzerland; German, French, Italian, or Romansh. This does not mean, however, that the principal of multiple use forestry is not recognized in Switzerland. On the contrary, multiple use of the forests rests on customs which date back to prehistoric times and is therefore much older than the concepts of forestry as restricted to wood production alone. It is, indeed, the recognition of the many benefits other than wood, derived from the forest, which have had a decisive influence on the formulation of forestry legislation and the development of Swiss forestry practices.

The magnificent glacier covered peaks of the Alps and the political structure as the world's oldest democracy have made Switzerland famous. They have also dominated the relation between the Swiss people and their forests. An attempt is made in this article to outline briefly, how the political development influenced the customs of forest use in this mountain land, how these customs changed with the intensified economic development of the country, and how public demand brought about forest conservation and the management of the forests in a way that enhances their protective influence on the mountain watersheds and safeguards their aesthetic values.

The lands inclosed within the present boundaries of Switzerland became relatively densely settled soon after the Roman conquest of Gaul, even in the deep valleys penetrating the heart of the Alps. By the middle of the 13th Century, practically all land suitable for agriculture had been cleared and the pattern of distribution between open land and forest has not changed materially since then. During the period of the Frankish kings, only the cultivated land was subdivided and was private property, while the king claimed all undivided land. He exercised mainly the right to the hunt, while the people maintained the right for the free use of the wood and pasture on these lands. During the development of the feudal system the owners of the castles restricted more and more the right of the rural communities. To defend their rights against the Counts of Hapsburg, the peasants

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of what are now the cantons around Lake Lucerne in the center of present-day Switzerland entered into a defensive league on August 1, 1291, which marks the beginning of the history of the Swiss Confederation. In several heroic battles in the 14th and 15th centuries they obtained complete independence. As a result of these historic developments the forests and the mountain pasture land remained the communal property of the villages. Even today of the total forest area 68.1 percent belong to communities or citizen corporations, 4.8 percent are cantonal or national property and only 27.1 percent are private property, mostly small farm forests. In several of the typical mountain cantons more than 90 percent of the forest land is in communal ownership. The right of each village citizen to his share of the communal forest and pasture prevented the formation of a rural proletariat in Switzerland. It gave the whole community a feeling of security and independence and is one of the foundations of Swiss democracy.

Free use prevailed on the communal land as long as the resource was adequate for the communities. Every citizen was entitled to the wood he needed for building, fencing and heating. There were no restrictions to grazing on the common lands. It is still the common practice for the farmers in the mountain districts to send their livestock to the communal pasture during the growing season. Soon after the snow has disappeared the cattle are taken out of the stables to the mountain pastures which occupy
the benches and the flat ground along the streams, and extend in a broad belt above the timberline to the fields of eternal snow and ice. These pastures are called "Alpen." The mainstay of the Swiss livestock industry is milk and not meat production. While the cows are on the high mountains, the milk is converted into cheese. Since milk production reacts much more quickly to the abundance or scarcity of the food supply than does meat production, grazing allotments to the individual households in the communities have been regulated to conform to what has been found to be the carrying capacity of the various alp units. Erosion caused by over-grazing has, therefore, not been a serious problem in the Swiss mountains.

The forest did not enjoy such intelligent management. It was only towards the end of the last century that forest management was generally introduced. Unrestricted cutting brought about a general deterioration of the forest. In a limited way the early settlers recognized, however, the protection which the forest gave against rolling stones and avalanches and built their villages in the shelter of well wooded slopes. The protecting forests were often declared ban forests and all cutting in them forbidden. Most famous is the ban forest of Altdorf, the town where Tell is said to have shot the apple from the head of his boy. Cutting restrictions from this forest were supported by ancient superstitions that the trees would shed blood if cut with an ax and that the axman's hand would grow out of his grave. Fire, mainly because of the prevailing low hazard, has not been a serious enemy; but poor cutting practices, grazing and litter collection have brought about over the centuries a general deterioration of the forests. It is estimated that in the alpine summer pastures, grazing and wood cutting by the milkers and cheese makers has lowered the timberline at an average by about 600 feet from that determined by climatic factors alone.

Although wood had long ceased to be plentiful and a shortage of timber began to make itself felt toward the middle of the last century, it was the great devastation caused by floods in the middle of the 19th century and again in 1868 which opened the eyes of the Swiss people to the deplorable condition of their forests. It made them realize that complete restoration of the mountain forests to a healthy condition was imperative for adequate watershed protection in the interest of the whole nation. Consequently the primary objective of the first Swiss forestry law of 1876 was to protect the forest of the watersheds in the high mountains. The forest law of 1902, now in force, covers all forests of the land. This law had a far reaching effect on the development of forestry in Switzerland. Some of the more im-
important provisions mentioned below, express clearly the high esteem in which the Swiss hold their forests.

To stop further deforestation the law provides that the forested area of Switzerland shall not be reduced. At present the forest occupy 2,541,746 acres or 25.0 percent of the total land area, while cultivated and grazing lands compose 52.4 percent, and the unproductive area, consisting of rocks, lakes, glaciers, rivers, roads and built-upon land contains the remaining 22.6 percent of the territory of Switzerland. The law prohibiting a decrease in the aggregate forest area appears the more arbitrary or even drastic when one considers, that the area of arable lands has long been insufficient and that agriculture is losing annually from 7 to 10 thousand acres of its best land to the growth of urban settlements and lines of communications. During World War II this provision was temporarily suspended to allow for increasing the national food production. Normally, Switzerland must depend on imports to supplement its domestic production of food and timber, the food supply shortage was, however, much more critical.

Further provisions of the forest law provide that all public forests be managed according to approved management plans to safeguard their productivity. The cantons, which correspond

Photo. Hans Burger.

All-aged selection forest near St. Moritz.

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politically to the States in this country, are obliged to classify the forests into protection and nonprotection forests. Clearcutting shall, generally, be forbidden in protection forests. This provision applies to private as well as public forest properties. On non-protection forests the private owner is free in the management of his forest property as long as he keeps it in forest growth. All harmful use of the forest for products other than wood (Nebennutzungen), especially grazing and litter collection, are forbidden or allowed only to a moderate extent, in all public forests as well as in the private protection forest. Most of such rights and servitudes have been expropriated against compensation in money or forest land. To compensate communities and private owners for the loss of freedom in the disposition of their forest property the federal government contributes to the cost of afforestation and the erection of structures necessary for erosion control on the headwaters, as well as to the construction of forest roads and of permanent installations for the extraction of timber.

More important than the law in reducing grazing in the forests has been a general improvement and intensification of the livestock industry. The increase in cattle from 1866 to 1947 and the simultaneous reduction in sheep and goats reflects this improvement which brought about a greater demand for good pasture and lessened the need for low quality sheep and goat range.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cattle</th>
<th>Sheep</th>
<th>Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>1866</td>
<td>993,291</td>
<td>447,001</td>
<td>375,482</td>
</tr>
<tr>
<td>1947</td>
<td>1,450,773</td>
<td>182,467</td>
<td>189,018</td>
</tr>
</tbody>
</table>

The tendency has been toward a strict separation of forest and pasture. Grazing in the forests of the lowlands has almost completely disappeared. On the high mountains, especially near the timberline, the boundary between forest and grassland is generally not well defined and fluid, and a certain amount of forest grazing is here inevitable. Typical forest pastures are now found only in the open larch forests and in the forested pastures of the broad plateaus of the Jura mountains. Here a joint use for grazing and wood products is the most efficient and only practical method of land management.

The provision of the forest law concerning federal contributions to the cost of forest roads in protection forest had a great beneficial influence on the development of good forest management. This help enabled the communities to build the necessary access roads which are a prerequisite for conservative timber cutting in mountain forests. Equally important is the financial help for reforestation, structures to hold back avalanches and to
stabilize streambeds. These costly works could not be accomplished without substantial contributions from the Federal Government.

Just as in this country the early development of forestry and its guidance on a sure path is intimately linked with the name of Gifford Pinchot, so in Switzerland Dr. John Coaz supplied the driving spirit during 63 years of his professional activity, much of the time as chief forester in Switzerland. It may be of interest to note here that these two men bore close physical resemblance to each other.

Since the shift from an agrarian to an industrial economy, which began approximately 70 years ago in Switzerland, the production from the forests had to be supplemented by imports, to satisfy the domestic demand of about 0.9 m³ per capita. A little more than one half of this is firewood. Of the total average annual wood consumption, which varied between 3½ and 4 million cubic meters from 1925 to 1939, about one sixth came from net imports. During the war the average annual wood consumption rose to over 5 million cubic meters, because wood had to substitute for coal, which is almost entirely imported from Germany. Also paper, which was formerly mainly imported, had to be produced from domestic sources. At the same time imports
dropped to less than one third of the average prewar amount. As a result, during the seven years from 1940 to 1946 inclusive, the forests had to be overcut at the rate of 61 percent of the regular cut. Luckily the public forest had built up considerable reserves, thanks to a conservative management policy, and were well able to make this sacrifice to the national welfare during the emergency, but the private forests, where the cutting had been relatively more severe, were heavily damaged during those years.

The Swiss public forests are among the most intensively managed of the world. There is, exclusive of private forests, about one technically trained forester for each 7,500 acres of forest and for communities, which have their own technical foresters, the area is about half of that. Administrators generally stay on the same post for many years, and thus become intimately acquainted with their forests and are able to observe the results of their silvicultural practices. The average annual yield of the forests of 50 cubic feet per acre, compared with 31.5 for the United States can be considered quite high and the average annual net income (1920-1939) from the public forests of about 20 Swiss francs, equivalent to about 5 U.S. dollars. per acre, very satisfactory in view of the difficult logging conditions which prevail on the large portion of the forests located on high mountains.

To assure competent management of their forests the Swiss established in 1855 a forestry school at the polytechnicum at Zurich. Prior to the establishment of this school Swiss foresters received their technical training in Germany. At that period the dogma of the soil rent and the clear-cutting system, developed in the extensive pine stands of the flat lands of northern Germany and oriented solely toward the wood production aspect of the forest, dominated the forestry teaching. It became however apparent that these methods could not be applied blindly to the complex mountain forests of Switzerland without jeopardizing their highest function, which lies in the protection of the land. The first manifestation of an independent Swiss forestry development showed itself in the field of silviculture. Practices were developed which by group-wise and single tree selection aimed at combining maximum wood production with uninterrupted soil protection. Outstanding among the many practical foresters which lead this movement are H. Bioley and W. Ammon; and under the inspired teaching of Professor A. Engler a whole generation of Swiss foresters grew up with a conception of silviculture based on the many-aged selection forest. In the control method Bioley created a suitable tool for regulating the cut of selection forests, which has received world-wide recognition.

It is natural that the recreational values of the forest rank

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very high in view of the great importance of the income from
Tourist trade in Switzerland's economy. Chambers of commerce
of resort towns and local development societies have constructed
forest paths, benches, fountains, direction signs, etc. to facilitate
the enjoyment of the forests. The American tourist traveling in
an automobile would, however, look in vain for the large camp
grounds and recreation areas of our National Parks and National
Forests. The great majority of tourists come to Switzerland still
by train; and the Swiss enjoy their beautiful scenery the slow and
hard way, on foot and not from an automobile. One may walk
on footpaths for miles through forests and meadows unhampered
by barbed-wire fences or no-trespassing signs. Short walks with
the family or with friends after a street car ride to the outside of
the city or a short train ride are as much a part of life as our
Sunday afternoon rides. Generally, the destination of these trips
is a small restaurant located on a mountain, where one can rest
and enjoy the view from an open terrace, but when the Father,
who carries the pocketbook in Switzerland, is not along, a snack
from the rucksack supplies the refreshments. Thanks to a highly
developed and well-served transportation system, every place, with

Photo. Kantonsforstamt Uri.

Reforestation and stream bed stabilization near Altdorf.
the exception of the higher peaks, is within a half-day hike from a railroad or bus line. Not only the better known places, but virtually every spot in Switzerland is at least occasionally visited on these wanderings. The Swiss public is, therefore, very familiar with its forests and is very proud of them. When it views its landscape, it does not see property lines following sectional subdivisions, it sees the fields in the valleys, the roads fitted to the contours of the land, and the forests, unmarred by large clearcuttings, covering and protecting the steep slopes. It likes what it sees and wants to keep it that way.

FACTS ABOUT THE AUTHOR

Rudolph Stahelin graduated from the Swiss Forestry School at Zurich in 1921. He has been employed with the U. S. F. S. since 1932 with time out to obtain a M. S. from California in 1935. At various times he has been assigned to the California, the Rocky Mountain and the Southern Experiment Stations. Since 1948 he has been with the Division of Forest Economics in Washington, D. C.
Watershed Management: The Forester's Challenge

By GEORGE W. CRADDOCK

Foresters are faced with a great challenge. This is to achieve ever increasing productivity from the nation's wild lands and at the same time maintain those lands in such a condition as to insure useful runoff to streams and ground water basins.

These are the dual objectives of watershed management. Their attainment constitutes a tremendous job when viewed in the cold light of accomplishment to date. However, much has been learned from past mistakes and the essential requirements for placing our lands under an effective system of watershed management are now fairly well defined. Some highlights of the present watershed situation are here reviewed together with the lines of action needed.

PRESENT STATUS OF WATERSHED MANAGEMENT

Effective watershed management has been the exception rather than the rule in our land use history. As a consequence, the condition of our watersheds today is not good.

The signs of watershed abuse are unmistakable. They are visible in raw gullies newly incised in formerly stable soil on forest, range, and farmlands. They are visible in ragged stream channels so greatly deepened and widened as to require great bridges when formerly they could be forded with ease. They are visible also in frequently swollen, silt-laden streams that used to flow regularly and clearly.

How our watersheds were abused is no mystery. The Rio Grande, the oldest used watershed in the country, provides a good example. Its history is fascinating though sad because in it are all the elements of western settlement. Here, civilization started by Pueblo Indians. Then came Spaniards. Then came troops and settlers and the development of a vast range livestock industry. By 1880 natural vegetation had been sadly depleted. Overgrazing, drought, fire, heavy timber cutting all impoverished the forest and range cover. Flash floods came. Great arroyos developed in the grassland. Huge gullies extended into once wooded foothills. Vast quantities of displaced soil moved down stream into the lower reaches of stream channels and out onto the valley lands.

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The signs of watershed abuse are visible in swollen, silt laden streams.

The results of these land abuses are well known; the aggrad­ing of the river bed, the waterlogging of thousands of acres of irrigated land, the deposition of silt into the reservoir. Today, the Rio Grande watershed is so seriously impaired as to make its recovery highly problematical.

The Yazoo watershed in northern Mississippi, provides another example of how man has been able to destroy his land. When first settled it was ripe for great usefulness. The soil was fertile, streams were deep and clear. However, clear cutting of timber, destructive logging and cotton agriculture set the familiar processes of uncontrolled runoff and accelerated erosion in motion. Results were disastrous. In some parts of the basin all the surface soil down to a depth of from 1 to 6 feet has been entirely eroded away. Annual flood damages amount to over $3,000,000. A recent flood control survey report states "the depleted condition of the watershed cover is a major cause of floods, principally be­cause this condition lowers the capacity of the soil mantle to absorb water."

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The Rio Grande and the Yazoo are not isolated cases. Surveys have been made on numerous watersheds—along the Pacific Coast, in the Southwest, the Intermountain Region, along the Rockies, on the Plains, in the Lake States, the Central States, the Northeast, the Southeast and in the South. These samples show that 12 percent of the entire land area of the country has been severely eroded, with a loss of some 75 percent of the topsoil. On 41 percent of the land there has been moderate erosion, resulting in the loss of between 25 and 75 percent of the topsoil. On another 25 percent of the land there has been less but serious accelerated erosion. Soil loss has meant not only decreased productivity but more frequent and greater flood discharges and far more sediment in stream channels.

Agricultural lands have been hard hit. It has been estimated that 70 percent of the soil loss and 40 percent of our water troubles center on these areas. A great area, 50 million acres, lies abandoned largely because the erosion of fertile topsoil has ruined its productivity. While considerable effort has been made to control erosion and runoff on farm lands, it is generally conceded that these efforts are not keeping pace with the problem.

Three-quarters of the forest land has a major or moderate influence on watershed protection. But because of poor cutting practices, woodland grazing, and fires, this area which includes much of the critical, steeply sloping, water yielding lands, has lost much of its watershed value. This is particularly true of the 300 million acres of privately owned forest land, 64 percent of which is so destructively cut as to prevent adequate regeneration of a useful forest stand. While the situation is better on publicly owned forest land, even on these there are many examples of poor cutting practices that have initiated surface runoff and accelerated soil erosion.

Range lands are in no better shape. Of the 780 million acres of range land, 589 million acres are eroding more or less seriously, reducing soil productivity and impairing watershed services. Three-fifths of these lands is adding to the silt loads of major streams. Considerable over-grazing and fire was necessary to get the range in this condition. And this, despite the fact that the value of watershed services of the range lands, in yielding water that is necessary for irrigation as well as life itself in the arid valleys, is several times greater than the grazing values of the watershed lands.

Many factors contributed to the present sick condition of our watershed lands. Chief of these was a lack of understanding that watersheds are a closely integrated complex of plants, animals, soil, rock, climate, and water which can be thrown out of balance.
when the function of any one of the components is impaired. Though signs of watershed deterioration were clearly visible in the early days of settlement there appeared to be no reason for alarm. Resources were abundant. Water shortages were neither frequent enough nor large enough to be of much concern. Even floods, for a time, were not sufficiently destructive to be alarming. As water shortages and surpluses became more serious, relief was sought mainly by building bigger dams, higher levees, and deeper wells.

The situation is different now. We need still more water and still greater protection from floods and sedimentation. We need this water for our own needs and to meet our responsibility for maintaining leadership among nations. Unfortunately, the rate of resource depletion is increasing while our resource reserves are less than ever before. This is the situation with our soil, our forests, our range, our wildlife, our minerals, as well as the water in our streams and ground water basins.

WHAT IS NEEDED TO OBTAIN WATERSHED MANAGEMENT?

The present watershed situation, as serious as it is, can be improved by good watershed management. How can this be accomplished? What is needed to place our watershed lands under a form of management that will restore and maintain conditions of useful runoff and increased productivity from the land? There are four major needs.

1. There must be a public recognition of watershed problems and of the important role that land use can play in either destroying or fostering favorable watershed behavior. The land must be recognized for what it is: a reservoir that can be made to yield not only useful crops of food, forage, timber, wildlife, and recreational opportunities but also essential supplies of water.

   This recognition must start at the top among the planners of government, of industry, of agriculture, of labor, and of education. It must be recognized by the users of the land—the farmers, graziers, foresters, sportsmen, and recreationists. It must be recognized by water users in the home, the office, the factory, on the farm and those that use water for power production and navigation. It must also be recognized in schools from the college level to the kindergarten, for unless the up-coming generation is informed, progress in getting watershed management will surely stop.

2. Damaged watersheds must be repaired. This can be done by stopping land-waste practices and by healing sores that
have already been made. This will cost money and take time but we have the know-how to proceed.

We can do a better job of fire prevention and suppression. This will stop the spread of watershed deterioration and permit nature’s healing processes to go forward.

We can stop devastation cutting and destructive logging on public lands. Private landowners could do the same. We can plant the millions of acres of forest land that are now virtually bare or only partially restocked with trees. The scars made by steep skidways and by logging roads can also be healed by mulching and planting. These measures, like fire control, will stop deterioration and speed recovery of the land.

We can take livestock out of critical watershed areas and
stop over-grazing on public lands. Private landowners could do the same. We can reseed millions of acres of depleted, eroding, flood-source range lands.

We can stop building unstable roads and can stabilize those that are now a sediment and flood menace.

We can stop building unstable waterways, canals and trans-basin water conveyances. We can also repair those that have already become a menace.

3. Favorable watershed conditions must be maintained. The repair of damaged lands is futile unless the treated lands are kept in good condition and other lands are kept from deteriorating. The measures required are now well known.

There must be close and continuous fire control, ranging from carefully prescribed light burning in some places to all-out protection in others. There must be careful harvesting of timber and prompt repair of logging damage or it may be necessary to forego any timber harvesting on very steep, easily damaged lands. There must be similarly conservative use of the range by domestic livestock and big game, and of scenic areas by recreationists. The construction of trails, roads, airfields, dams, watering places and holding corrals for livestock, channels, canals, pipe lines, power lines, home sites, and resorts should be undertaken only when these developments will not cause accelerated erosion, destructive floods, or a decrease in the quality of water.

When there are questions of doubt as to the degree of safe land use, there should be little or no use until safe specifications can be developed from careful study and test. Many watersheds are too susceptible of damage to warrant the taking of any risks that are not fully known.

Achievement of these objectives will be relatively easy on public lands for there is ample authority to do all the things that are necessary to bring about watershed management. The job is more difficult on private lands. One solution here is for public ownership of these lands on which private interests cannot afford the cost of repair and maintenance. On others, some form of public subsidy, safeguarded by assurance of compliance, may be another feasible approach.

4. Conflicting land-use problems must be solved. The on-site uses of land—for timber, forage, food, wildlife, recreation and even for homes and factories—often conflict with the requirements for producing useful water yields. These conflicts are more imaginary than real in many cases for, except where watershed management requires total exclusion of use, good watershed
management generally means good crops, good hunting, and good recreation as well as good water.

The solution of these management problems requires that the use of all measures within watershed units be integrated into a comprehensive plan that will take into consideration both the on-site values and those provided by the reservoir functions of the land. We can no longer afford to base the management of watershed lands on uncoordinated plans of the forester, the grazier, the wildlifer, the recreationist, the road builder, the farmer, the construction engineer, the hydrologist, or the politician. The techniques and skills of all are needed. Each, however, applies to but one or a few of the many components of watershed lands. These skills must be brought together and focused on the whole problem in each watershed.

Some progress has already been made toward the integration and coordination of land use for watershed management purposes. A good start was made with the creation of the National Forest system. The Flood Control Surveys by the U. S. Department of Agriculture in recent years have given further impetus to an overall approach, though this effort is limited largely to flood control considerations. It is also limited by economic concepts which in effect require that watersheds be impaired before management is justifiable. Hopeful, too, is the growing interest in the watershed management aspects of entire drainage basin programs such as the TVA and the programs now being considered for the Missouri and the Columbia. Perhaps all that is needed now is public approval of continuing commissions of committees at the national and regional levels which will have authority to consider and approve comprehensive drainage basin programs in which all development and land uses are fully coordinated with requirements for watershed management.

WHAT CAN BE THE RESULT?

Watershed management when fully applied and given time can change the face of our land. Gray, naked land will again be green. Soils that are now wrinkled with rain washed rills will again be smooth. Slopes now incised by steep walled gullies and arroyos will again be rounded and stable. So also, will presently caving and sagging main stream channel banks be smoothed and stabilized.

This change in the face of the land will improve all of the important characteristics of runoff. It will not prevent all floods or all sedimentation, or will it provide all of the water that could be used in all places. It will, however, mean fewer and lesser
floods, smaller sediment loads, less contaminated water, clearer water, sweeter water and a more regular flow in streams and to ground water basins.

The new look of the land surface upstream will mean richer, more productive soil. With it will come greater crops of food, forage and timber to meet our growing national and international needs. With it too will come more birds, more game, more fish, more beauty to satisfy the sportsman and to rest the weary.

Downstream, the prolonged flow of clearer water will be a boon to all water users. Water treatment costs will lower. The life of reservoirs will be prolonged. Waterways and harbors will require less costly dredging. Commercial fishing can be expanded. The danger of floods will be lessened.

Watershed management, in short, will maximize the usefulness of all our resources of land and water. These are the goals that challenge the foresters of today.

INTRODUCING OUR AUTHOR

George W. Craddock has worked on phases of watershed management research since joining the staff of the Intermountain Forest and Range Experiment Station in 1929. This has included 4 years of research on spring-fall sheep range in Idaho and summer range in Utah, 4 years on watershed research in Idaho, and 4 years on flood-control surveys in the western states. Since 1946 he has been in charge of watershed management and protection research at the Intermountain Station. Mr. Craddock has written extensively on subjects relating to his research. He holds degrees in agriculture and forestry from the University of California.
Multiple-Use Potentialities of the Farm Woodlot

By Harold F. Scholz

The Value of Forests Was Recognized in Early Soil Conservation Programs

During the past twenty years there has been a growing appreciation of the need for conserving the forest resources of southwestern Wisconsin. As a result, many tracts of woodlands which formerly were given little protection, and no management, now are dedicated to sustained timber production. Actually, the growing of forest crops is only one of the objectives of the present-day program, and other accompanying benefits are sufficiently important to justify the claim that the multiple use of timber lands is an accomplished fact on many farms in this region. Thus, the value of forest cover and associated vegetation in reducing runoff, erosion, and the amount of top soil lost through excessive blowing was recognized from the start. In the decade from 1930 to 1940, thousands of acres of woodlands on farms throughout southern Wisconsin and southern Minnesota were fenced and protected from livestock and fire. Less frequently the stands were thinned or given other types of silvicultural treatment. The Civilian Conservation Corps and other public works agencies provided impetus for this forestry program.

Probably the most noteworthy accomplishments of these woodland activities of the "thirties" were educational rather than technical. As a result of them, hundreds of farmers began, for the first time, to think of their forests as an integrated part of the farm business, rather than as isolated blocks of timber which contributed little or nothing to the yearly family income.

There is Increasing Interest in the Well-Managed Farm Woodlot

What ultimate effect this changed viewpoint may have on timber production and water and soil conservation remains to be seen. There are many indications, though, that the basic idea of integrating the use of cropland and pasture with forestry practices really has taken root in the dairy farming regions of southern Wisconsin and southern Minnesota. Research, demonstrations, and the increased availability of publicly-financed technical service

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all undoubtedly have helped to convince farmers that their wood-
lots deserve to be protected and managed properly.

Take the case of research for example. Watershed investiga-
tions carried on at the Upper Mississippi Valley Soil Conserva-
tion Experiment Station in La Crosse County, Wisconsin showed that a
11.5-acre ungrazed forest on slopes ranging up to fifty percent,
yielded approximately 2.1 percent as much run-off as a grazed
woodlot and 6.8 percent as much as a well-vegetated, open blue
grass pasture\(^2\). Even more striking is the fact that in the 12-year
period since 1938, no measureable run-off or soil loss has occurred
from the protected timbered area.

Grazing studies\(^3\) made in Richland and Sauk Counties, Wis-
consin, also provided convincing evidence that insufficient forage
is produced, even on sparsely-wooded slopes, to justify the further
destruction of forest value by continued grazing. Average annual
forage consumption\(^4\) for the woods pasture was 276 pounds of dry
matter per acre as compared to 1453 pounds for open, unimproved
blue grass lands and 3210 pounds for open, renovated grazing
areas. Thus, it took 5.3 acres of woods pasture to produce as much
feed as an acre of untreated pasture and 11.6 acres to produce as
much as one acre of improved pasture. If these forage-consump-
tion investigations had been carried on under stands of good den-
sity where the ground was fully-shaded there undoubtedly would
have been even less than 276 pounds of dry matter per acre eaten
by livestock. Nor should the erosion-hazard angle of grazing steep,
partially wooded slopes be overlooked.

The conservation of Water and soil by protected, well-man-
aged woodlands represents an undisputed tangible value. The
same thing may be said of the reduction in flood damage to agri-
cultural and urban properties, the improved fish and wildlife con-
ditions, and the enhanced recreational opportunities which are so
evident on the occasional watershed which has been organized with
the objective of using each parcel of farm land for the purpose for
which it is best suited. A classic example of such an area is the
6,000-acre Gilmore Creek drainage near Winona, Minnesota. Farmers
on that unit were so interested in adopting erosion-control
and water-conservation measures that eventually more than ninety
percent participation resulted.

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\(^2\) Lake States Forest Experiment Station, University Farm, St. Paul, Minnesota. 1938. Technical Notes, No. 138.
\(^4\) The amount of animal food actually utilized by dairy cows, instead of total production, was measured. This was accomplished by a sampling procedure involving the use of 234 \(\frac{1}{4}\) mil-acre wire cages.

*Ames Forester*
Most Farmers Feel that Forestry Must be Justified on Economic Grounds

While it is true that more and more farmers have a growing appreciation of the value of protected forests in saving water and soil, these benefits, in themselves, do not have sufficient popular appeal to stimulate a real forestry program. Most land owners feel, instead, that unless their woodlands contribute to the general farm income there is little practical justification in spending time and money on them.

This gully developed from run-off which originated on a heavily-grazed, half-timbered, half-open slope. No cropland was involved. La Crosse County, Wisconsin.

In recognition of this economic consideration, a study was made several years ago of the actual yield possibilities of the mixed-oak stands which constitute the largest portion of the farm woodland acreage of southern Wisconsin and southern Minnesota. This investigation showed that maximum net yields of 8700 board feet per acre at 80 years are obtainable on medium sites. Under the best possible conditions of soil and moisture (very good site) substantially the same net volume, 9150 board feet per acre, was recorded for fully-stocked forests only 60 years in age. Re-


Nineteen Fifty-One
Fertile bottomlands often are ruined by the combined run-off from cultivated ridges and intermediate, open, or partially-timbered drainages. One of the objectives of land-use planning is to eliminate such needless waste of soil. Houston County, Minnesota.

Regional averages for southern Wisconsin and southern Minnesota, of course, are much lower than these maximum yields. However, there are enough undisturbed or lightly cut mixed-oak stands in the two states to provide physical proof that net yields of 5000 to 7500 board feet per acre at 80 years frequently do occur.

There are several ways in which a farmer can "cash-in" on the material which grows in his woodlot. First, he can sell stumpage, if there is no other way for him to get rid of his timber. Stumpage sales on entire blocks of timber are bad insofar as they deplete the growing stock and unless he marks the timber to be cut, the individual owner surrenders control over what is cut and how much is taken. Technical advise on these points can be obtained by consulting the nearest public forester.

Another alternative which is open to the woods owner is to convert his standing trees into logs and sell these f.o.b. the farm or mill. In this way he receives the stumpage price, plus a labor allowance for cutting, skidding and hauling, assuming, of course, he is equipped to do heavy-duty trucking. In certain parts of Wisconsin, log-making has become an established practice among farmers. One of the best illustrations of this trends is found in 48 Ames Forester.
Vernon County where, in 1946, about 75 cars of high-grade logs, 25,000 bowling pins, and a half million board feet of lumber were manufactured or shipped as rough products by one small urban center. The majority of the logs in this instance were cut by farmers from their own woodlots. In some localities, the profits from woods work have been increased substantially by pooling and grading the logs and marketing them cooperatively.

A third method of obtaining revenue from farm-grown timber is to convert the logs into lumber or dimension stock for home-use. Usually the only cash outlays needed are for hauling the logs to the mill and the sawing charge. If arrangements can be made for a portable mill to set up at the farmstead, at least a part of the hauling costs can be saved.

Even when all costs for stumpage, milling, and hauling are included, and the farmer's time spent on felling, bucking, skidding, etc., is credited at current labor rates, his home-grown lumber costs him only about half as much as substitute materials at retail prices. In this manner, the timber owner gets maximum financial return from his farm woods. The possible uses of forest products obtained from the various timber species of the north-central region depend on such physical properties as strength, durability, nail-holding characteristics, tendency to warp, etc. Such information is available in various publications, often in highly-condensed form.

The Forests of the Dairy-Farming Region of Southern Wisconsin and Southern Minnesota Still are Extensive and Valuable

If multiple-use forestry, in the sense that the term applies on the average farm, is to have any real meaning in southern Wisconsin and southern Minnesota, further deterioration of the remaining better woodlots must be prevented. In spite of past misuse and poor management, these forests still total 81½ million acres. They produce an estimated $20,000,000 worth of products annually and provide at least a part of the raw material for 1700 wood-using industries in the region. It is almost an economic corollary that the only way small-scale forestry enterprises can be made to pay, is by frequent harvests of highly-productive woods.


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Approximately 10,000 veneer and high-grade sawlogs are concentrated in this yard for shipment. This material was cut in the winter of 1947-1948, mostly by farmers from their own woodlots, in Vernon, Richland, and Juneau Counties, Wisconsin.

The farmer owning these excellent logs, principally basswood, appreciated their high value for home-sawn lumber. Shortly after this picture was taken, they were converted into 4/4 boards or dimension stock by a portable mill. Richland County, Wis.

The Timber Harvest Forest May Be the Key to Better Woodlot Management

Farmers or other owners of small timber tracts usually question the practicability of good forest practices on two grounds. First, they do not see how it is possible to handle a continuous
crop, which often require 50 to 100 years to reach merchantable size. Their second objection is that the total yearly or periodic return from stumpage, logs, rough lumber, and other forest products is relatively small as compared to the total income from the sale of cash crops, livestock, milk, etc. On this basis, they insist that forestry does not pay.

In 1944, there was initiated in Wisconsin a type of forest-management activity which has proven to be extremely effective in meeting the foregoing objectives. What this program does is to provide a number of publicly-owned woodlots, called Timber Harvest Forests, which serve as outdoor laboratories for farmers and other timber owners. Once a year, or in some cases once every two or three years, special field days are held on these tracts.

The foresters in charge of a Timber Harvest Forest field day program stress the necessity for limiting the annual or periodic harvest to a volume equal to, or less than, the growth of the entire stand since the last cut. The original volume, as determined by an intensive cruise, is likened to the capital investment of a business concern, and the growth is compared to the interest or return for use of this money. Prior to holding the field day, the logs or bolts representing the allowable cut are concentrated at one or two landings. This provides a visual demonstration of just what the total annual or periodic growth for the entire woodlot means in terms of usable products. At the same time this fact is called to the farmer's attention, the forester also points out why certain trees were cut and others were left. Thus he is able, in the woods, to get across the twin ideas of the continuous, regulated harvest and the elementary principles of good forest management.

A special effort also is made at these field meetings to stress the "economics" of farm forestry. The main point of emphasis is that the returns for woods work, usually felling and skidding, in terms of wages per hour compare very favorably with any other farm activity. Records for the various Timber Harvest Forests in Wisconsin repeatedly have shown that log-making pays the operator from $1.25 to $2.00 per hour for the 200 or so hours he spends annually in his own woodlot. Studies in northern Michigan and Vermont substantiate these hourly rates.

Another objective of the Timber Harvest Forest demonstrations is to bring the farmer and other timber owners up to date on

new types of woods equipment and improved methods of logging, loading, and hauling. One- and two-man power chain saws, skidding arches and similar devices, trucks equipped with self-loading booms or winches, and on-the-spot sawing of lumber by portable mills, invariably seem to catch the eye and interest of the field-day crowds. Occasionally a log-sawing contest or some other competitive feature may be included on the program.

On the basis of a 6-year trial period, there seems to be little doubt that the Wisconsin Timber Harvest Forests have provided the incentive for new interest in farm forestry throughout the state. This conclusion appears to be justified by the size of the crowds, typically 200 to 300 persons, which attend the field-day demonstrations and by the increasing number of requests from farmers for technical assistance in managing their woodlands and marketing products from them. While admittedly it will take many years to restore the productivity of hundreds of small, badly-abused timber tracts in the region, the accomplishments of recent years indicate clearly that the majority of these forest-owners are aware of the multiple value of a well-kept woodland for conserving water and soil, improving wildlife conditions, and assuring a continuous supply of bolts, logs, posts, fuelwood, and other valuable products.

This situation is a challenge to the entire forestry profession. The question which foresters must answer is this: Will the program of education, demonstration, and professional assistance which has proven so effective in recent years, constantly be improved and broadened to keep pace with public interest, or will it gradually lose momentum and its popular appeal, after reaching only the most conservation-minded “fringe” of small woodland owners? Time alone will tell.

FACTS ABOUT THE AUTHOR

My pre-college residence was Lee County, Iowa. Attended Iowa University from 1921 to 1923; entered Iowa State College in 1924 and graduated in 1929. Member of Alpha Zeta and Gamma Sigma Delta. Obtained M.F. from Harvard University in 1931.

Employed on the Nantahala National Forest in 1926 and by the Appalachian Forest Experiment Station in 1927-'28. Transferred to the Lake State Forest Experiment Station in 1928 where I have been ever since, except for a 15-month absence on educational furlough.

Research activities have included projects in mensuration, forest soils, planting forest influences, flood control, and management. Am currently in charge of Farm Forestry Research for southern Wisconsin, with headquarters at the Northern Lake Forest Research Center, Rhinelander, Wisconsin.

Am author or co-author of various technical bulletins and articles. Was married in 1937 and have two sons and a daughter.
FORESTRY
COME IN

The Department
Forestry Department Staff

Seniors
Seniors

LOUIS ALLEN—Webster Groves, Missouri—Summer Camp 1949
Sales and buying in the Pulp and Paper industry is Lou’s field of interest. As for hobbies, Lou enjoys hunting, fishing and sports of all kinds. Lou’s experience includes fire control work on the Malhuer National Forest. His activities include the Ames Forester, Winter Sports Carnival and vice-president of Phi Delta Theta.

DONALD AXT—Oak Park, Illinois—Summer Camp 1949
Don’s field of interest is utilization and he has worked for the U.S.F.S. at the Cascade Locks, Oregon. His hobbies are ornithology, botany and photography, the latter of which he is no amateur. Don is a member of the Forestry Club and Alpha Tau Omega Social fraternity.

TED BAUER—Dubuque—Summer Camp 1949
T. J. worked at the Priest River Experiment Station in 1949 and last year he was engaged in logging and milling in northeast Iowa. Bob’s field of interest is utilization. His hobbies are hunting, fishing and gun collecting. Bob is secretary of the Forestry Club and served on the forestry open house committee during Veishea.

MILTON BEAVIN—Sioux Falls, South Dakota—Summer Camp 1949
Milt had his experience with the Bureau of Reclamation in 1950 and worked on Blister Rust Control in Yosemite National Park during 1947. His activities include the Iowa State Singers, Roger William Club and Alpha Chi Rho Social fraternity. Milt enjoys music and fishing as hobbies.

ALFRED BLAISDELL—Boulder Junction, Wisconsin—Summer Camp 1948—Married
Al’s field of interest is forest management and his experience includes plantation survival survey on the Northern Highland Forest, Wisconsin, and nursery work on Trout Lake State Forest Headquarters, Wisconsin. Fishing and hunting are Al’s favorite pastime.

DONALD BLUMENTHAL—Chicago, Illinois—Summer Camp 1949
Don worked for the Cook County Forest Preserve Nursery at Chicago during the past two summers. He has also attended the R.O.T.C. Camp at Fort Sill, Oklahoma. He is a member of the Forestry Club and also a member of Beta Sigma Phi Social fraternity. His field of interest is management and his hobbies include shooting and golf.

Ames Forester
GENE BRUGERE—Sioux Falls, South Dakota—Summer Camp 1948
Brug's field of interest is forest management and he has worked on Blister Rust Control on the Superior National Forest and as a lookout on Mount Baker National Forest. His activities include the Forestry Club and his hobbies are hunting and fishing.

DAYLE BRUNS—Titonka—Summer Camp 1947—Married
Dayle's interests lie in the retail lumber business and timber management. He has worked for the Wietz Company of Des Moines and the Fuel Economy Company of Wisconsin. He enjoys baseball, wrestling and woodworking. His school activities include wrestling and he is a member of the Forestry Club. Dayle is married and has one boy.

JAMES BURNS—Algona—Summer Camp 1949
Jim was engaged in logging in northern Iowa last year and has also done a little carpenter work. His field of interest lies in private industry and he enjoys hunting, fishing and showing pigeons.

DALE CAMPBELL—Elvaston, Illinois—Summer Camp 1949—Married
Last summer Dale was employed as a logger and sawmill worker in northeast Iowa and during the summers of 1946-48 he worked for the Illinois Highway Commission. He is a hunting and fishing enthusiast and also enjoys baseball. Dale is a member of the Forestry Club and also the Ames Forester. He is married and has two children.

ROBERT CHAPMAN—Waterloo—Summer Camp 1948—Married
Retail and wholesale lumber sales and nursery work are Bob's field of interest. Bob worked for the Arthur Iron Mining Company as an assistant engineer and also for the Ames Nursery. He is a member of the Ames Forester; Forestry Club and the Iowa Agriculturalist. His favorite pastime is photography plus hunting and fishing. Bob is married and has one daughter.

WILLIAM CLAYCOMB—Ames—Summer Camp 1949—Married
Bill was employed last summer at the state game farm at Boone; and as you would expect his interest is game and wildlife management. His favorite pastime is hunting.

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WILLIAM CORBIN—Monticello—Summer Camp 1949
Range management and planting are Bill's field of interest. He was employed by the Iowa State Forest Nursery last year. His hobbies include woodcraft and hunting.

ROLAND CRAFT—Milwaukee, Wisconsin—Summer Camp 1948
In 1945 and 1946 Roland worked on Blister Rust Control on the Clearwater National Forest and last year he worked at trail maintenance on the Beaverhead National Forest and he plans on working for the Forest Service after graduation. His hobbies include hunting and fishing. He is a member of the Forestry Club and the I.S.C. intramurals.

LEONARD DIAB—Dexter—Summer Camp 1948—Married
Len was employed last year by the Century Lumber Company. He has been a member of the Iowa State football team, wrestling team and also the Forestry Club. Len plans on entering the retail lumber business after graduating.

WILLARD DITTMAN—Whiting—Summer Camp 1949
Ditt was a fire control aid on the Umqua National Forest last year and had time to enjoy his favorite hobbies which are hunting, fishing and trapping. Ditt is a member of the Forestry Club.

LESTER FLEMING—Runnells—Summer Camp 1948—Married
Les's field of interest in wildlife management and last year he was employed at the Northern Lakes Forest Research Center, Rhinelander, Wisconsin. His activities include the Forestry Club and the Ames Forester and he enjoys hunting and fishing. He is married and has two daughters.

WALLACE FIXIN—Wabasso, Minnesota—Summer Camp 1948
Last year Wall was employed by the U.S.F.S. at Kenton, Michigan on timber sales. His hobbies are hunting and outdoor sports and he is also a member of the Forestry Club. He plans on working for the forest service after graduation.
JOHN FORNEY—Stanton, Nebraska—Summer Camp 1947
John spent last summer as smoke chaser for the forest service. His hobbies are hunting and fishing and his field of interest is wildlife management.

HARRY FRY—Carlisle—Summer Camp 1946—Married
Harry is a member of the Forestry Club and hopes to enter the field of forest products or silviculture upon graduation. He spends most of his spare time studying archeology.

DONALD E. GLASIER—Palatine, Illinois—Summer Camp 1948—Married
Don's field of interest is forest forestry and management. He spent the last few summers in the tree trimming and removal business and also spent some time on farm forestry projects. His activities include the Forestry Club, Ames Forester and secretary of the Memorial Lutheran Church.

NORMAN J. HANSON—Atlantic—Summer Camp 1948
Norm's interest lies in land-use management and upon graduation he would like to enter this field. He has worked for the forest service as a headquarters guard in 1949 and 1950 and as a lookout in 1947. His hobbies include hunting, fishing, ornithology, photography and taxidermy. He was secretary of the Forestry Club and also worked on Veishea exhibits.

NEWTON HANSON—Memphis, Tennessee—Summer Camp 1948
Last summer Newt scaled logs in eastern Mississippi and upon graduation he plans on getting into private industry.
RICHARD W. HARDCOFF—LaVerne—Summer Camp 1948
Last summer Dick spent at the R.O.T.C. Summer Camp and the year before he was a fire fighter with the forest service. His interest is range management. His activities include the Forestry Club, Veishea, Ward System, Arnold Air Society and the Scabbard and Blade. Dick enjoys sports, music and hunting.

GENE HERTEL—Marshalltown—Summer Camp 1948—Married
Gene worked for the Iowa State Nursery last summer and the year before he worked as a lookout on the Ochoco National Forest in Oregon. He plans on working for private industry when graduated. He is a member of the Forestry Club and enjoys hunting and fishing in his spare time.

GROVER HERTZBERG—Des Moines—Summer Camp 1948
“Spider” belongs to Theta Delta Chi social fraternity and was co-chairman of the ’50 fall campfire. He spent a summer selling lumber and paint and is interested in utilization. His hobbies include fishing and fly tying.

PETER HOEKSTRA—The Hague, Holland—Summer Camp 1949
Pete’s field of interest is management and last summer he was employed by a seed firm. Pete is a member of the Sigma Nu social fraternity. His hobbies include sports, foreign travel and philosophy.

FRANCIS HORAK—Silver Springs, Maryland—Summer Camp 1948
Last summer Frank cruised timber on the Fort Apache Indian Reservation in Arizona. He is a member of the Forestry Club, Ames Forester, Credit Manager of the Iowa State Daily, Camera Club and Toastmasters Club. His interest is timber management and his hobbies include hunting, fishing and sports in general.

GEORGE HUNGATE—Auburn—Summer Camp 1949—Married
George worked as bulldozer operator and for the St. Marys Lumber Company for the past two years. His hobbies are hunting and fishing.
DONALD IMFELD—Joliet, Illinois—Summer Camp 1949—Married
Last summer Don worked on timber sales in the Chequamegon National Forest in Wisconsin. He is a member of the Forestry Club, Pammel sports club, and associate editor of the Ames Forester. Upon graduation he plans on entering private industry in the sales division. His hobbies include fishing, hunting and all sports.

STANLEY JARRARD—Washington—Summer Camp 1948—Married
Stan was employed as a crew foreman at the Iowa State Nursery. He plans on wildlife management work after graduation or general forestry. His activities include the Forestry Club and the Ames Forester. When not working Stan enjoys hunting, fishing and photography. He is married and has one child.

TED JASKULSKI—Chicago, Illinois—Summer Camp 1949
Ted was employed by the Cook County Forest Preserve district of Illinois last summer. His activities include the Forestry Club, Ames Forester and Ward system. Upon graduation Ted plans on getting into the fish and wildlife service. His hobbies include fishing and golf.

ARTHUR JENSEN—Chicago, Illinois—Summer Camp 1949
For the past three years Art has been employed by the forest service as a smoke jumper and fire guard. His activities include the wrestling team, President of the Forestry Club, Ward system, and Festival choir. Art's interest is the field of management. His hobbies include guns, photography, stamp collecting and hunting.

MICHAEL KOMANETSKY—Beuldl Illinois—Summer Camp 1949—Married
Mike plans to enter range work or wildlife service upon graduation. His hobbies include collecting insects and stamp collecting. Mike is also a member of the Forestry Club.

JERVIS LANG—Joliet, Illinois—Summer Camp 1948
Jerv was employed as a fire guard on the Payette National Forest in 1949. His activities include the Forestry Club and local advertising manager of the Ames Forester. Jerv enjoys golf, swimming and hunting as hobbies. Upon graduation he plans on entering private industry.

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ARTHUR LYNN—Cedar Falls—Summer Camp 1949
Art probably has more experience in the forest service than any other student. Last summer Art was smoke jumping at Missoula, Montana. He is a member of the Forestry Club and his hobbies include hunting, photography, flying and sports of all kinds. Upon graduation Art plans to enter the field of timber management.

RICHARD MARSH—Sioux Rapids—Summer Camp 1948
Dick plans on entering private industry after graduation. He is a member of the Forestry Club, Veishea float committee and the Veishea open house committee. His hobbies include fishing and studying people.

CARROL McANINCH—Mount Ayr
Mac has spent the last two years as a smoke chaser and lookout on the Wenatchee National Forest, Washington. Upon graduation he plans on entering the field of wildlife management. Mac enjoys sports of all kinds. He is a member of the Forestry Club.

FRED McMILLAN—Granite City, Illinois—Summer Camp 1949—Married
Wally was employed last year at the Iowa State Conservation Commission Game Farm at Boone and plans on entering the field of wildlife upon graduation. He is a member of the Forestry Club and enjoys hunting and fishing in his spare time.

ROGER MERRITT—New Lenox, Illinois—Summer Camp 1948
Roger’s experience includes various jobs on the Rogue River National Forest and the Payette National Forest. Rog. is a member of the Forestry Club, I.S.C. intramurals and the M.R.A. His hobbies include team sports, hunting and fishing.

ROBERT MERRIAM—Fairfield—Summer Camp 1949
Bob has been employed as a lookout on Priest Lake, Blister Rust Control on Priest Lake and Flood Survey Control, Pacific Northwest Forest and Range Experiment Station. He is a member of the Forestry Club, Pep Council and Sigma Phi Epsilon. Bob’s field of interest is mensuration and influences.
RALPH MILLER—Eau Claire, Wisconsin—Summer Camp 1949
Ralph plans on entering the field of range management after graduation. Last summer he was employed as a smoke chaser on the Malheur National Forest. He is a member of the Forestry Club, Newman Club and the Ward system.

MANFRED MOEHLER—Chicago, Illinois—Summer Camp 1949
Last summer Fred was employed as a lookout fireman on the Kaniksu National Forest and after graduation he plans to get into private industry. He is a member of the Newman Club, Forestry Club and Ward system. His favorite hobby is fishing.

ROBERT MORGAN—Marshalltown—Summer Camp 1949—Married
Bob spent last summer as a field foreman at the Iowa State Nursery and upon graduation he plans to enter the field of wildlife management. His hobbies include hunting and fishing.

JAMES MORTENSEN—Yankton, South Dakota—Summer Camp 1950
Jim is interested in general forestry and is active in the Forestry Club. His hobbies include hunting and fishing.

RICHARD MUELLER—Boone—Summer Camp 1950—Married
After graduation Dick plans on entering the field of forest research. His hobbies include ping pong, fishing and billiards.

PAUL NEEDHAM—Boone—Summer Camp 1948
Paul has been employed as a smoke jumper in 1948 and last year in range research in Georgia. His activities include the Agriculture Curriculum Committee, Editor of the Ames Forester and a member of the Pi Kappa Phi social fraternity. He enjoys hunting and fishing in his spare time.
STANLEY NERVIG—Hardy—Summer Camp 1949
Stan's field of interest is utilization. His activities include the Forestry Club, Ward system and L.S.A. He enjoys sports, stamp and coin collecting and hunting as his favorite hobbies.

DEAN NORMAN—Fairfield—Summer Camp 1948—Married
Stretch was employed as a carpenter last summer and upon graduation plans to enter the retail lumber business. His activities include football, basketball and Phi Kappa Psi.

JACK PARSONS—Buffalo—Summer Camp 1948
Jack spent the last two summers smoke chasing in Wyoming. He plans to enter the field of range management. Jack is a member of the Forestry Club and the wrestling team. His hobbies are hunting and gun collecting.

DICK POSEKANY—Elberon—Summer Camp 1948
Dick was employed by Weyerhaeuser Company, Longview, Washington as a logger. Upon graduation he plans on entering private industry. His activities include Cardinal Key, President of M.R.A., President of Noble House, Cardinal Guild, Agricultural Council, Forestry Club, Holst State Forest Advisory Committee and Business Manager of the Ames Forester. Dick spends his spare time hunting and fishing.

DONALD RAWLINS—Percival—Summer Camp 1948
Last summer Don was an instrument man on a survey crew in southern Iowa and after graduation he plans to enter range management. He enjoys hunting and fishing in his spare time. His activities include the Forestry Club, Social Bureau and Social Chairman of Kimball House.

EUGENE READINGER—Guthrie Center—Summer Camp 1947
In 1948 Gene was employed as a fire fighter on the Superior National Forest and in 1949 he cruised timber on the Sitgreaves National Forest and last summer he supervised brush work on the Sitgreaves National Forest. Gene plans on timber management or range management after graduation. He is a member of the Forestry Club and Ames Forester. His hobbies are photography, hunting and sports.
ROLAND REHM—Fort Dodge—Summer Camp 1949—Married
Sandy’s field of interest is industry-sales division. Last summer he was employed by E. L. Bruce Company of Memphis, Tennessee. His hobbies include sailing, cooking and woodworking. He is a member of the Forestry Club, Sigma Phi Upsilon social fraternity and participates in fraternity sports.

LAWRENCE RENARD—Concordia, Kansas—Summer Camp 1949—Married
Larry’s field of interest is general forestry. Last summer he worked at the Swattle Guard Station on the Mount Baker National Forest. He is a member of the Forestry Club and enjoys fishing, hunting and chess as his hobbies. Larry has a baby girl.

HARMON ROSS—Hector, Arkansas—Summer Camp 1950—Married
Harmon has worked in the cooperage industry and also on Blister Rust Control in Idaho. He also has been an assistant agriculture teacher in Devalls Bluff, Arkansas. Forest management is his field of interest. He enjoys hunting and fishing as hobbies. He has one child.

JAMES RUPPELT—Ames—Summer Camp 1949
Fire control and park service are Jim’s field of interest and he was employed as a park ranger in Zion National Park, Utah last year. Jim is a member of the Forestry Club and enjoys flying and hunting as hobbies.

EDWARD SABA—Chicago, Illinois—Summer Camp 1949
Last summer Ed was employed in the furniture technical laboratory of the Sherwin Williams Paint Company of Chicago. Previous to this he had worked for the Diamond Match Company of Albeni Falls, Idaho. After graduation he plans to enter industry in the utilization field. He is a member of the Forestry Club and his hobbies are fishing and photography.

HAROLD O. SCHADT—Chicago, Illinois—Summer Camp 1949—Married
Forest products is Otto’s field of interest. Last summer he was employed by the Hines Lumber Company of Chicago. He is a member of the Forestry Club and the I.S.C. Glee Club. His hobbies include music, photography and sports of all kinds.

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JAMES SCHOCK—Kansas City, Missouri—Summer Camp 1949—Married
Jim has done surveying work for the Iowa State Highway Commission, the
Missouri State Highway Commission and the Rock Island Railroad. Utilization
and sales are his field of interest. He is a member of Forestry Club and his
hobbies are carpentry, fishing and hunting. He is the father of one child.

JACK SMITH—Kansas City, Missouri—Summer Camp 1948
Smitty worked as a prevention guard on the Mount Hood National Forest,
Oregon and his field of interest is forest administration. Jack is a member of
the Forestry Club and enjoys hunting and fishing as hobbies.

WALTER SMITH—Perth Amboy, New Jersey—Summer Camp 1949—Married
Walt’s field of interest is private industry or research. Last summer he was
employed as a technical assistant for routine operations and research on the
Harvard Forest, Petersham, Massachusetts. His activities include the Forestry
Club and Theta Xi social fraternity. Walt is the father of a baby boy.

DONALD SODERLING—Forest City—Summer Camp 1949—Married
Soil conservation is Don’s field of interest. Last summer he was a lookout on
Mount Baker, Washington. He is a member of the Forestry Club and his hobbies
are photography and woodworking.

WAYNE SORENSEN—Cedar Rapids—Summer Camp 1949—Married
Wildlife management is Wayne’s field of interest. Last summer he was a
member of a survey crew on a Spruce Beetle Control Project on the White River
National Forest in Colorado. He is a member of the Forestry Club and enjoys
sports of all kinds as his hobby. He is the father of one child.

ROBERT STEVENS—Ira Grove—Summer Camp 1948
Last summer Bob was employed as a lookout on the Medicine Bow National
Forest. His field of interest is utilization. He is a member of the Forestry Club
and his hobby is fishing.
DUANE STOPPEL—Rochester, Minnesota—Summer Camp 1949
Duane plans to enter the field of range management after graduation. He is a member of the Forestry Club and Ward system. His hobbies include hunting and fishing.

GORDON SWEITZER—Beloit, Wisconsin—Summer Camp 1950
Gord’s field of interest is silviculture. He is a member of the Forestry Club and his hobbies include billiards and sports of all kinds.

BLAINE TENNIS—Des Moines—Summer Camp 1947
For the past three summers Blaine has worked for the Forest Service on the Lewis and Clark National Forest. Range management is his field of interest. Blaine is a member of the Newman Club and the Phi Kappa Social fraternity. His hobby is fishing.

JOSEPH TOMASCHESKI—Des Moines—Summer Camp 1948
For the past two summers Joe has worked for the Forest Service on the Kaniksu National Forest, Washington as a lookout. He is art editor of the Ames Forester, Secretary of the Inter-Fraternity Council and President of the Phi Kappa social fraternity. Timber management is his field of interest. Hunting and sports of all kinds are his favorite hobbies.

THOMAS VANDERSHULE—Glenwood—Summer Camp 1947—Married
Vandy was employed by the Forest Service as a fire crew in Oregon and he also worked for the Iowa State Nursery. General forestry work is his field of interest. His hobbies include hunting, woodcraft and metalcraft. Vandy is the proud father of two children.

JAMES WAHL—Boone—Summer Camp 1948
Jim worked on trail maintenance and smoke chasing for the Forest Service the last two summers. He plans to enter the field of timber management after graduation. He is a member of the Forestry Club and his hobbies are hunting, fishing and taxidermy.
HAROLD WAHLGREN—Chicago, Illinois—Summer Camp 1949
Harold worked on trail maintenance and smoke chasing for the Forest Service the past two summers. He is a member of the Ames Forester, Vice-president of the Forestry Club and Head Resident of Hughes Hall. His hobbies are hunting and fishing. When graduated he plans on entering the field of timber management.

JOHN WATERS—Enid, Oklahoma—Summer Camp 1949—Married
Last summer John was employed by the Ames Nursery and did sales and maintenance work. He is a member of the Forestry Club and his hobbies are hunting and fishing. He plans on entering the wildlife service after graduation. John is the father of one child.

WILLIAM WENDELL—Somerville, New Jersey—Summer Camp 1949
Soil Conservation is Bill's field of interest. Last summer he was employed as a lookout-fireman on the Wenatchee National Forest, Washington. He is a member of the Forestry Club and his hobbies are photography, woodworking, hunting and fishing.

ROBERT WIER—Humboldt—Summer Camp 1948
He was employed as a lookout on the Rogue River National Forest, Oregon and did trail maintenance work on the Beaverhead National Forest, Montana. His activities include the Forestry Club and intramurals. When graduated he plans on entering the field of timber management. His hobbies are hunting, bridge and table tennis.

JIM WILLIAMS—Summer Camp 1947
Jim's interest lies in forest management and education (he has an education minor). He worked on the Fort Apache Indian Reservation as an assistant dispatcher. His activities include the Forestry Club and being married. He has two children.
JUNIOR CLASS

Front Row, left to right: Siegfried Kemele, William Ritter, Wilbur Brown, Leo Mitchell, Jim Cartwright, Robert Tobiaski, Al Leuthauser, George Ebert, Merle Hemphill, Miles Gulik, John Wilson.


SOPHOMORE CLASS

Front row, left to right: Ferree, Max; Fulton, Max; Campbell, Oliver; Kandrat, Andy; Graves, Dick; Lhotka, Frank; Breon, Duane; Christ, Duane; Setzer, Ted; Stanton, John.

Second Row, left to right: Chance, Richard; Knutsen, Stanley, Shaw, Adalbert; Kuester, Allen; Martin, Tom; Pringle, Ronald; Richards, Merrill; Morgan, Donald; Dale, Martin; Twito, Roger.

Third row, left to right: Arrasmith, Paul; Kale, Wilson; Burdett, Paul; Cheney, Bruce; Runneals, Larry; Edgern, Jim; Cooper, Glenn; Russell, Robert; Jarvis, John; Herrick, Own; Maurek, Peter; Martin, Tom.
FRESHMAN CLASS

Front row, left to right: Kruneroy, Wayne; Wright, John; Allman, Fred; Melroy, Dana; Paakkonen, Onnie; Lamansky, Bill; Miller, Charles, Schallan, Conard.

Second row, left to right: Corrigan, Clayton; Maxfield, Don; Richardson, Dean; Ohrtman, Franklin; Sellers, Harold; Lassen, Laurence; Neiderman, Duane.

Third row, left to right: Smith, Ronald; Bardin, Alvin; Szymeczek, Frank; Heyer, Warner; Larsen, Donald; Sladkey, John; Fox, Vincent; Trcka, Frank; Peterson, Robert.
Forestry Summer Camp 1950

For the men who will be attending Forestry Summer Camp in 1951, here is a summary of events of the 1950 camp. One of the objectives in summer camp is to get a broad outlook of the fields of work in forestry. This aids the men attending camp to find their interest and to direct their college work towards the field of their choice.

The first three weeks of camp were spent near Kirbyville, Texas on an old C.C.C. site located on the E. O. Siecke State Forest. The remaining five weeks were spent in Arizona with camp headquarters on the Chalender Ranger Station near Wil­liams, Arizona.

The fields of work covered during the summer were as follows:

Forestry 244: Forest Mensuration. A timber cruise was made on 640 acres with each three man crew covering approximately half of the area. After complete field data had been taken, a cruise map and timber estimate was written up. One day was devoted to timber marking and log scaling under the direction of the Forest Service.

Forestry 250: National Forest Operations. Forest Service rangers conducted tours of and discussed the problems involved in supervising our national forests. Forests visited included: Angelina National Forest, Jasper, Texas; Kaibab National Forest, Williams, Arizona; Sierra Ancha Experimental Forest near Roosevelt, Arizona.

Forestry 214: Silviculture. In Texas, field studies of the various forest types were made. In addition to this, reproduction methods and the determination of site quality were also covered. The study of prunings and thinnings was taken up in Arizona. These studies were made in the field with every man in camp taking a try at swinging an axe or operating a pruning saw.

Forestry 234: Utilization. Trips to logging operations, saw mills, planing mills, a paper mill, a veneer factory, an excelsior

1. Some of the boys stop to cool off.
2. Profs always sling something.
4. A friend from Arizona.
5. Puzzle: Find the forester.
6. Main street, Southern U.S.A.
7. Clean-up time in New Mexico.
8. Long Bell Wood Preserving Plant.
factory, a chemical plant where old pine stumps were utilized, a wood preservation plant and a hardwood flooring mill were included in this course. Skidding operations studied varied from the use of mules to a D-8 Caterpillar and a fair lead arch. All sizes of mills from the small portable type to the larger steam powered variety were also included in the field trips. Much information as to mill layout and efficiency was gained during these trips.

During weekends and while making field trips, many points of scenic and historic interest were seen. Some of them were: Carlsbad Caverns, Petrified Forest, Painted Desert, Grand Canyon, Roosevelt Reservoir, Tonto Rim, Lake Mormon, Montezuma’s Castle and the Tonto National Monument. A hike to the bottom of Grand Canyon and a mountain climbing expedition to the top of Mt. Humphreys highlighted the weekend trips made by the men.

These are only a very few of the events happening at camp during the past summer. Nothing short of a book could list them all. Many of the summer camp experiences will be remembered as the highlights of an Iowa State Forester’s college career.

1. Big log or small man?
2. Cross-haul loading.
3. Some camera shy foresters.
4. Lookout tower in Texas.
5. Kirby Lumber Company in Texas.
7. Officer’s country in Texas.
8. “Shorty,” the cook, looks the situation over.

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The Unknown Soldier

Now it can be told! During a routine inspection of the summer camp area, an inspecting officer confiscated a small black book containing confidential information. A traitor had taken notes on the lives of fifty-five men during summer camp. These facts have never before been revealed to the outside world. Now for the first time, six months since the traitor was lost in battle, his memoirs can be published.

After being duly censored by the intelligence officer, the little black book read as follows:

Dear Diary: I, (censored), of sound mind and stable stature this 13th day of June wish to state that I am going to reveal to the world, the true picture of life at the 1950 summer camp. In the event that I should lose these notes or be prosecuted as a traitor, my last request is that they be published for the benefit of any resultant gold star next of kin.

June 13: Three platoons left troop headquarters at Ames and started on an 180 degree azimuth (due south, that is). Two platoons left yesterday, pioneering the migration to Kirbyville, Texas. We spent the first night beneath the stars and fireworks of Neosho, Missouri.

June 14: We rolled out of our cots at 5 a.m. and hit the sod. The Dodge transport was laid up in surgery until 10 o’clock. Then once again we were enjoying a 100 degree sunbath in the back of our converted convertible. Privates King and Johnston purchased hats of the ten-gallon variety. Perhaps this was in preparation for the days to follow. We reached Texarkana at 8 p.m. and began a search for troop accommodations. After being directed to the colored YMCA three times, we admitted defeat and proceeded to leave the city peacefully.

June 15: We reached camp E. O. Siecke about 4:30 p.m. After the troops were settled, shined and shampooed, an evening liberty bus made the first trip into Kirbyville. Numerous Southern Belles (age 14) were found to greet tourists or anyone else that came along.

June 16: The first day of drill. Our captain led us into the swamps. By 3 p.m. we were completely confused and totally lost. We were saved from an extended study of silviculture when a squadron of mosquitoes came to the rescue. They led

1. DeJong, Burdett, Lokken, Cartwright.
3. State forest field trip.
4. Two young foresters in Louisiana.
5. Fall back, we’ll get her on the next ridge!
6. Gathering fire wood for “Shorty”.

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the few men who could still navigate away from the dangers that lurked in the swamps of darkest Texas.

June 17-18: Privates Martin and Richards could no longer control their emotions. It ended in their buying Stetson’s, the hat that made summer camp famous.

Our brave lieutenant spent some time explaining to one of the natives in Kirbyville that we were a company of men, college men, if you please. Just as we had convinced him that we were at least old enough to leave our mothers, three of the enlisted men came bouncing up the street firing cap pistols. From that moment, we were permanently dubbed as either boy foresters or boy scouts.

June 19: We visited one of Uncle’s federal fortresses. During our campaign in Angel’s Timber (referred to in more formal literature as the Angelina National Forest), Corporal JO-JO Stanton mired one of the troop transports. We were shot out of luck, until we procured a chain and a few horsepower from one of the other transports.

We completely lost account of time. Calendars, one of the luxuries of the Ames headquarters, were unavailable. For days we rambled through the woods looking for Smokey Bear of Forest Service fame. Our last conclusion was that we must be enjoying one of the seven wonders of the world. For it is only in Texas that you can stand neck deep in mud and get dust in your eyes.

Private Maurek found the burden too heavy and after eating his favorite peanut butter sandwiches, he fell asleep. The commander took pictures of the spectacle as evidence to be used in the forthcoming court-martial.

Dr. Whitecloud of Indian descent briefed the troops one evening on the timber cutting Anglo-Saxons. His story began in 1492 when the guests arrived. He traced the movement of the “displaced persons” across the United States to their present position.

After many strenuous campaigns, the troops’ favorite battle cry was, “Ammate the hardwoods.” At last victory was ours and word came from the high command that the day was near when we could go to rest camp in the land of Arizona. This boosted the morale of the troops to the point where the chaplain dispensed with his sympathy cards and crying towels.

1. Long Bell Wood Preserving Plant.
2. Eating one of those famous sack lunches.
4. Truck Wrecking, Inc.
5. Another field trip.
6. A veneer mill.
7. Crosby Chemical Company
8. Crosby Chemical Company.

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During our trek to the land of Arizona, we passed through civilization and found the date to be July 9. We spent all day chasing snipers in the Caverns of Carlsbad.

July 10: More sniper hunting in the Painted Desert and the Petrified Forest.

One of the Corporals began dreaming of a white Christmas and the transport he was driving strayed from the road. Unfortunately the troops aboard were not issued the deluxe equipment of hip pocket parachutes. Consequently, when they next contacted Mother Earth, they bounced about the landscape. However the "scenery" was a just compensation during their stay in sick bay.

The remainder of the troops reached Camp Kaibab and began the construction of vital facilities. Two days later the wigwams were set up and the troops were ready for the worst.

Our first assignment in the land of Arizona was to do reconnaissance. We worked day after day until we had a complete list of Blackjacks and Bulls over ten inches d.b.h. (distance between horns). In a few days the battle was over and we hung up our cruiser's sticks awaiting the next campaign.

July 23: We spent Saturday afternoon and Sunday climbing Humphrey's peak. On the descent, one of the troops wandered off into the valley since there wasn't a hill to go over. The field generals each gained a streak of gray over the loss of a good soldier. But within a few hours Corporal Klein turned up. Our hopes of a big search on the morrow with no classes rapidly faded.

We spent many memorable evenings in the Wagon Wheel Lodge writing reports and enjoying the fire. It was our unofficial coffee shop, library and lounge (more lounge than anything else).

Among the many problems encountered during the summer were how to get the Jolly Roger, No. 28, from atop the flag pole and why the boards were "washed" on the green chain. Also the natives were worried that we might read too many books. They were persuaded in one easy lesson not to lose any sleep over the matter.

July 26: Tomorrow we leave for Southern Arizona to do some maneuvers on an experimental forest. During our trip we will be introduced to a new weapon, the V-notch weir.

1. The forester's private zoo.
2. The Ames Philharmonic.
3. Veishea float.
4. Log bucking contest.
5. Prof's Thomson and Herrick.
The soldier who kept this diary was lost in the Saguaro Campaign near Roosevelt Dam, Arizona. It is thought that he became confused between a barrel cactus and a porcupine. Not knowing which way to turn, he sat down. This tragic step led to his insanity and eventual death. If this diary had been discovered a few days earlier, the traitor would have been cast into the depths of the Canyon Club. Since this was not the case, this diary has been published in the memory of the daring unknown soldier of the 1950 summer camp.

Veishea 1950

Veishea festivities of 1950 were given an added oomph! by the biggest event to ever hit Iowa State's campus, Paul Bunyan Day! For the first time Paul Bunyan Day was celebrated along with Veishea as one of the scheduled events. Several of the Forestry Club members, headed by Hank Haskell, really put the show over.

The Saturday afternoon crowd was attracted by raucous jeering and the cloud of a forthcoming battle. And battle it turned out to be! Axmen, sawyers, birlers, and bearded tobacco-spittin' timber beasts, all pitted against one another. Out of this turney came solid proof of an old axiom, "A good big man is better than a good little man!"

Ted Bauer, all 295 pounds of him, showed perfect form to sweep the axman's events. He easily out-paced his opponents in the log-quartering contest. When he finished, his nearest rival dropped his ax and gasped, "Done?—I'm Glad." One of the frustrated foresters had taken such a prodigious first swing at his log that he succeeded in freeing his ax only in time to see Ted stop, mop his brow, and collect his prize from Queen of Queens, Jo Ary.

Bauer also won the chopping contest when the closest competitor lost the blade from his ax. It was odd the way the size and speed of the chips diminished as the event progressed.

Ollie Sapousek was another two-time winner. He displayed the skill and brawn it takes to toss a fair sized log 36 feet and 8 inches. Lin Proeber gained the crowd's favor by unleashing his

1. Ted Bauer heaves the log.
2. Sapousek chops.
3. The splinter derby.
4. Throwing the chain.
5. The last lap.
6. Going up.
wiry frame to toss the log nearly as far as his husky rivals. The fellow who fell flat on his face wishes to remain anonymous.

If one looks at the grass in front of Ag Hall, he may still see a spot of diseased grass. The blades show unusual symptoms. There is an unmistakable odor of vile tobacco juice. The disease started to spread until the Botany department spread a circle of Listerine around the affected areas. The bill for one bottle of Listerine came to the Forestry Club treasurer. All this was a direct result of the Tobacco-spitting contest. Several techniques were employed, none of which proved to be the solution necessary to hit the four-inch funnel. Art Jensen shined in the first heat. He stepped up to the line, didn't aim, didn't poise, but simply spat for the most decisive bulls-eye of the event. Art was unable to keep up with the scorching pace, though, and Don Clay sneaked by to win.

Ollie Sapousek won his second event by being the most afraid to fall into Lake LaVerne. The foresters showed the crowd that the art of birling is not forgotten, just that it ain't what it used to be. Ollie managed to keep on his log longer than any of the contestants who opposed him. I wonder what "Canoe-shoe" of Priest River fame was doing that day?

Art Jensen went up his greased-pole so fast and with such ease that some suspect him of using Dutch Cleanser on his hands. Still, to go up a twenty-five foot pole like he did, it takes a muscle or two.

There is one event you are warned not to bring up to any forester. That is the log-sawing event. Prof. Dave Herrick and Prof. George Thompson calmly out-sawed the winning pair of sawyers, Dayle Bruns, and Leonhardt Daib. When asked for their opinion of the incident, the entire crowd of foresters replied —"unfortunate."

Prof. Dwight Bensend and Prof. Leonard Kellogg judged the brush-piles—oops! I mean the beards. Although Don Riddle won the judges decision, it was a very close race. Jim Cartwright became so attached to his beard that he refused to cut off the mustache. He claimed that his wife liked it!

After the pageantry was over, and the prizes were given to the winners, Hank Haskel pulled the sly maneuver of the year. He chauffeured Queen Jo Ary to her house.

Taking everything into consideration, the foresters probably did the best job on campus during VEISHEA. We won honorable mention in our Open House, on our parade float, and were loudly acclaimed for putting on a fine show with Paul Bunyan Day.

Ames Forester

Second row: Fry, Harry J.; Brown, Wilbert E.; Fleming, Richard E.; Proeger, Linden P.; Kuester, Allan F.; Worley, George R.; Lokken, Clayton; Ferree, Max; Fixen, Wallace; Lang, Jervis W.; Jaskulski, Thaddeus M.

Third row: Popp, Richard D.; Fleming, Lester C.; Dittman, Willard H.; Craft, Roland E.; Chapman, Robert; Ehrlich, Glenn H.; Komanetsky, Michael; Kiemle, Siegfried F.; Fox, Vincent D.; Mitchell, Leo D.


Fifth row: Hilliard, William K.; Jarrard, Stanley; Rawlins, Donald E.; McMillan, Fred W.; Murphy, William E.; Wahl, James D.; Hartman, Theodore A.; Campbell, Dale C.; Schadt, Harold O.; Posekany, Richard L.

Sixth row: Mayberry, Gerald D.; Dose, Joseph C.; Rist, Don E.; Shock, James H.; McAninch, Carroll D.; Dale, James E.; Barden, Alvin L.; Waters, John W.; Smith, Roland D.; Renard, Lawrence P.; Haas, Richard E.

Forestry Club 1951

SENIORS


Nineteen Fifty-One
Honors

Many foresters have been recognized for their achievements in scholarship and activities in the past year.

At the twenty-fifth annual Honors Day Program held May 18, 1950, Edwin Zaidlicz was named as the 1950 Honor Student in Forestry. Mike Kageorge, Bill Claycomb, Paul Needham and Siegfried Kiemle were recognized for outstanding scholarship.

Four foresters were elected to Alpha Zeta. Those initiated were: Ted Hartman, Bill Murphy, Paul Needham, and Harold Wahlgren. They were selected from the upper two-fifths of the juniors and seniors in the Division of Agriculture on the basis of scholarship, leadership and character.

Gamma Sigma Delta elects seniors from the upper fourth of their class and graduate students who have shown research ability.
in agriculture. Mike Kageorge was selected from the students and Dave Herrick from our faculty.

Phi Kappa Phi, which selects men from the highest sixteenth of the graduating class and outstanding graduate students named faculty member Dr. Dwight Bensend and Mike Kageorge to membership.

Dick Posekany was recognized for his campus activities by being elected to Cardinal Key.

We salute these men for their achievements.

The American Forestry Association Convention

The silence of early morning was broken, as three carloads of Foresters rolled out of Ames. The purpose of the mass migration was attending the 75th anniversary convention of the American Forestry Association in Eagle River, Wisconsin. Arriving in Eagle River Sunday evening these Foresters registered and established an I. S. C. outpost in the C.C.C. barracks which housed the college delegates attending the convention.

The program presented by the Association proved to be most interesting and educational. The Wisconsin Conservation Commission guided bus tours of scenic Northern Wisconsin, describing the points of interest such as the National Container Corp.'s portable wood chipper and various stands of timber under diversified silvicultural treatments. A Wisconsin fire equipment demonstration was given, showing in operation the different mechanical methods of using water and earth in forest fire suppression. The delicious hot field lunches by charming hostesses were a feature that could well be fitted into future summer camp programs.

Evenings were made very enjoyable by well planned entertainment. The smoke filled Eagle River Stadium added atmosphere to the Paul Bunyan Barbeque. Superbly prepared venison with all the trimmings was served until everyone had their fill. A feature of this event was the introduction of the delegations of all the forestry schools represented.

On the last evening in Eagle River everyone attended a banquet featuring the presentation of American Forestry Association Awards.

The convention was a complete success in that it gave the student delegates both a good time and a deeper appreciation of the field of forestry.
Forestry Club

Office

President ..................... Art Jensen ............. Tom Cochran
Vice-President ............... Shorty Knoll ........ Harold Wahlgren
Secretary .................... Earl Fritcher ........ Norm Hanson
Treasurer ..................... T. J. Bauer .............
Faculty Advisor ............... Prof. George Thompson .......
Senior Ag. Council Representative Dick Posekany ..........
Junior Ag. Council Representative Ted Hartman ..............

The vigorous enthusiasm that is such a part of the Forestry Club was back in full force this past year. It was a year marked by new highs in original ideas for Veishea, the parties and the smokers that made them the most successful in many years.

In an effort to encourage the growth of world forestry, the Forestry Club donated $25 worth of Forestry books to the University of the Philippines to help restock their library.

The total membership this year was 189. This represented the active part of the Forestry department. Most of the members pitched in willingly whenever a job was to be done. As an example, during the last meeting, a Veishea Work Meeting was held. This was well attended and much was accomplished.

All members of the Faculty were extremely cooperative with the club. The Forestry Department provided trucks for transportation, tents for the Veishea Open House, tools, and suggestions. Particular credit should be given to Prof. Bensend for his aid in the Veishea program and for judging Paul Bunyan Day along with Prof. Kellogg; to George Thompson for his presence at Club meetings and his good suggestions; and finally to Prof. Hartman for his general encouragement and support of the Club.

In the past year, the Forestry Club once again proved that it was the most enthusiastic and active departmental club on campus.

Forestry Student Wives

The Forestry Student Wives Club was organized in 1948 through the efforts of several of the faculty wives. Today, as in the first years of the organization, these faculty wives are closely associated with our club. They meet with us twice a year; once as hostesses and again as visitors.

Meetings are held bi-monthly in the homes of members. This year we have had guest speakers and a few good sessions of
Canasta. Chili suppers, picnics and square dances with the husbands give us a chance to become acquainted with the foresters we hear mentioned at home.

Baby-sitters, husband's tests and naturally the number of married foresters control the membership of our club. Each new quarter brings us new members and new officers.

Throughout the year, our club gives us a better understanding of the forestry profession, lots of fun and new friends.

ANN LEUTHAUSER, President.

Fall Campfire

The quiet woods west of Ames echoed the evening of October 19, 1950 with that well known rallying cry of the confused forester, "Which way do we go from here?" As one by one, the mighty woodsmen finally beat their way through the jungle to that elusive spot, Sunset Rock, they found other venturesome souls grouped around a flaming campfire. Such was the setting of the 1950 Fall Campfire.

Co-chairmen Art Lynn and Linden Proeger saw to it that the men were well fed and entertained. After everyone had had their fill of buns and weiners, potatoes, baked beans, coffee and cider, Kieth Schreiner, an Iowa State zoologist spoke to the group. His talk was both interesting and informative—a combination some instructors might try to attain.

The evening ended as the fire died down and everyone sang the old and familiar songs dear to the Iowa State Foresters.

New Staff Members

RUSSELL E. GETTY

In the Spring of ’48, the Forestry Department welcomed back Russell E. Getty as an assistant professor. Mr. Getty is an Iowa State man through and through. He received his B.S. from Iowa State in 1936, and served in the capacity of editor of the AMES FORESTER the same year.

In addition to carrying on his studies toward an M.S. (which he will receive this summer), Getty is also an instructor and forest research worker for the Agricultural Experiment Station. His specialties are range management and aerial photo interpretation. Mr. Getty’s research work concerns the lumber market problem. After receiving his M.S., Mr. Getty hopes to work toward a Ph.D.

Mr. Getty has had many interesting experiences since I.S.C. saw him last in 1936. Two summers with the Indian Service prior to graduation paved Mr. Getty’s way to eight years of full employment with the Service, interrupted only by World War II. From 1936 to 1942, Getty was Senior Project Manager at the Sac and Fox (Iowa); Winnebago.
(Nebraska); Great Lakes (North Wisconsin and Michigan); and the Sioux (South Dakota) Indian Reservations. During the war, Getty served as a Lieutenant Gunnery Officer in the U. S. Navy's Pacific campaign. He left the Navy in 1946 with a permanent rank of Lieutenant Commander and the distinction of having crossed the great Pacific fourteen times. After the war, Mr. Getty once more went to work with the Indian Service as Forest and Range Supervisor on the Crow and Northern Cheyenne Indian Reservation in Montana. From here, the magnetic lure of the Iowa State campus brought him once more to Iowa.

Although a part of his regular job with the Indian Service, Getty made a hobby out of managing the buffalo herds on the Sioux (Pine Ridge) and Crow Indian Reservations in South Dakota and Montana. Mr. Getty managed 300 head of buffalo on the Pine Ridge Reservation and 1000 head on the Crow Reservation—a task which to him was more fun than work during his stay on these Reservations.

Mr. Getty resides at 1117 Stafford Avenue, Ames, with his family which includes two daughters, aged nine and two, and one more recent addition—a six month old boy.

RAYMOND L. SARLES

Of the two new personalities appearing in the Forestry Department last fall, one is Raymond L. Sarles, newly appointed instructor to the Forestry Staff. Last fall, many of us met him for the first time in Forestry 245 and 490, and this winter in Forestry 388.

After graduating from Rocky River High School, Rocky River, Ohio, in 1944, Mr. Sarles was stationed at Baldwin-Wallace College, Berea, Ohio, as a Navy trainee. After a tour of general duty and a discharge from the Navy in 1946, he re-entered Baldwin-Wallace and received his B.S. degree as a botany major in 1947. Sarles was a science instructor at South Amherst High School, South Amherst, Ohio, for a year before once more going back to the books—this time at the University of Michigan. By 1950, he had received his B.E. and M.F.

Mr. Sarles also brought his wife and four month old daughter to Iowa. He has settled his family at 394 Pammel.

ART ESCHNER

The second new personality in the department is Art Eschner, graduate assistant. Eschner has the big job of initiating the development of the Brayton Memorial Forest acquired by Iowa State College a year ago this last summer. The Brayton Forest is a 300 acre tract of land in Delaware County between Delhi and Hopkinton, Iowa, willed to Iowa State by the late Miss Emma L. Brayton in memory of her parents. At present, Mr. Eschner is making topographic and type surveys of the tract. Later, he will receive aid from the Soil's Department in a soil survey. After he has made a complete map of the tract, it will be divided into management areas suitable for research studies.

After graduating from Buffalo East High School, Buffalo, New York, in 1943, Eschner spent three years from 1943 to 1946 in the Navy. In the fall of '46, he entered the Syracuse College of Forestry where he received his B.S.F. in the spring of 1950. In the summer of '49, Eschner did survey work for the Division of Lands and Forests, New York State Conservation Commission.

Mr. Eschner lives at 3217 Lettie Street, Ames.

We welcome these three men and wish them many successful years at I. S. C.

Ames Forester
Foresters Hoedown

The foresters ushered in the spring quarter of last year in fine fashion at the Forester's Hoedown. The annual dance was under the direction of Don Axt whose committees did an excellent job of preparing an evening's entertainment.

The usefulness of forestry training was severely questioned when the women outguessed the men 3 to 1 in a common forester's contest. The problem was to determine the age of a Lodgepole Pine section at 5 paces. For those of you still in doubt, the correct age was 69 years.

Jack Berka and his orchestra provided the music for the affair. Entertainment during intermission was headed by Art Lynn. It consisted of bits of humor by Lynn and other members of the Department and songs by Ollie Sapousek, Iowa State's Burl Ives, Jerry Marshall and Webb Brown.

The bar-room featured such refreshments as rootbeer, cider, punch, potato chips and popcorn, which supplied the gang with energy until late in the evening.

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The Holst State Forest is a 318 acre tract of land nine miles northwest of Boone, Iowa, located in a hilly wooded section of country along the Des Moines River. The Tract gives practical experience to neophyte foresters in management, silviculture and hard work.

During the past year final plantings were made in the culmination of a two year project testing the growing qualities of various conifers in Iowa soil. The 10 acre plantation is growing slowly at best and it is already obvious that certain species are not adapted to this part of the country.

Forty rods of fence were put in this year which effectively put an end to the problem of cattle grazing in the Forest area.

Erosion control plantings were made along the sandy road banks. Black Locust was planted and already the results of its soil holding abilities are noticeable. Culverts were put in at key points across the road and have been effective in keeping the road in shape.

A small test project of Multiflora Rose for wildlife cover was planted. During the summer the bushes put on excellent growth and arrangements have been made to plant more next spring.

Logging is expected to start in the Winter of 1950. Markets for fuel-wood and sawlogs have been secured locally. The students are looking forward to this opportunity to gain valuable woods experience.

A farmer living adjacent to the Tract has been appointed fire warden and custodian. This measure was deemed necessary because of the high fire danger and because of past theft in coniferous plantings.

This year the Holst State Forest Advisory Committee is under the chairmanship of Dick Posekany. Ted Bauer is the other Senior representative. The Junior representatives are Floyd Lodge and Hank Haskell. Dick Chance and Bob Connor are the Sophomore representatives and Alvin Barden and Charles Miller are representatives from the Freshman class.
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BALTHIS, R. F., Vicksburg, Miss. Retired.

1908
HAEPFNER, H. E., 4242 N.E. Failing St., Portland 13, Ore. Chief Forester, St. Helen's Pulp and Paper Co.

1909
ALLEN, SHIRLEY W., School of Forestry and Conservation, University of Michigan, Ann Arbor, Mich. Professor of Forestry. 820 Daniel St., Ann Arbor, Mich.

1911
BARRETT, R. L., 323 S. Ripley St., Neosho, Missouri. District Agricultural Agent, University of Missouri.
FREEMAN, FRANK G., 1926 Greenleaf St., Santa Ana, Calif. Insurance.
SMITH, P. T., 107 23rd St., Sioux City, Iowa. Manager, Animal Feed Dept., Cudahy Packing Co.

1912
LESSEL, L. R., USFS, Williams, Arizona. Supervisor, Kaibab National Forest.
*O'BANION, A. C.
RICHMOND, H. H., Cass Lake, Minn. Timber producer-owner.
SMITH, WILLIAM A., 501 Hall of Records, Los Angeles 12, Calif. Los Angeles County Supervisor.

1913
BAXTER, L. J., Galva, Iowa. Farming.
*CLARK, H. B.
HENSEL, R. L., Texas Agricultural Experiment Station, College Station, Texas. In charge of Pasture Investigations.
RINGHEIM, H. I., c/o Monarch Lbr. Co., Ltd., Winnipeg, Manitoba, Canada. Retail Lumberman.

1914
HASSEL, W. C., 1158 J. Ave. N.W., Cedar Rapids, Iowa. Penick & Ford, Inc.
HAYES, RALPH W., Louisiana State Univ., Baton Rouge, La. Director, School of Forestry.
STERRETT, JOHN C., 249 S. Villa Ave., Villa Park, Ill. Real Estate.
VAN BOSKIRK, S. S., Ephriam, Utah. Retired USFS.
*WOLF, E. T.

1915
BODK, I. T., Missouri Conservation Commission, Jefferson City, Mo. Director.
*HICKS, L. E.

1916
CORNELL, HARVEY H., 717 Camine del Monte Sol, Santa Fe, N. M. Regional Landscape Architect, Natl. Park Service.
GEISLER, MAX, 925 Wesley Ave., Evanston, Ill. Sales Promotion Mgr. The Harry Alter Co.
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Svendsby, C., 514 S. Wellesley, Albuquerque, N. M. Chief, Reg. Forestry Div., SCS.

Tharp, M., Oleo, Bellefontaine, Ohio. Farmer.

Wallin, C. W., 9823 Lake Ave., Cleveland 2, Ohio. Sales Mgr., Cozier Container Corp.


1927

Fullerton, Neil, Box 331, Thompson Falls, Mont. Forester, Cabinet Natl. Forest.

Gibbs, J. A., Rt. 3, Spartanburg, S. C. Chief, Regional Forestry Div., SCS.

Hutchings, Gordon C., Rt. 1, Henderson, Colo. Trout Farm.


Latham, Orrin, New York State Ranger School, Wanakena, N. Y. Assoc. Prof. of Forestry.

McKinley, Raymond M., Box 497, Cleveland, Tenn. Asst. Supervisor Cherokee Natl. Forest.


Rindt, Charles A., Post Office Bldg., Portland 8, Oregon. Timber Management, Regional Office, USFS.

Schelling, Walter L., Room 204, South Bldg., USDA, Washington 25, D. C. Chief, Division of Watershed Management, USFS.


Wiggins, Verne, Story City, Iowa. Town Clerk.

1928


Battell, S. M., Home address C/O Mrs. F. R. Battell, 2812 Arbor St., Ames, Iowa.

Boeckh, Fred E., 1015 2nd St., International Falls, Minn. Supt., Insulite Div., Minnesota and Ontario Paper Co.

Hill, Edwin, 2702 Monroe St., Madison, Wisc. Asst. State Conservationist SCS.


Kahler, Leslie H., State Tree Nursery, Jonesboro, Ill. Superintendent.


Lefley, Wm. M., Penn, State College, State College, Pa. Assoc. Prof. of Psychology.

Lester, Orville, Rt. 1, Indianapolis, Ind. Farming.

Lundberg, R. W., Sequoia Natl. Park, Calif. Park Ranger.


Sonner, Orville, Hamburg, Iowa. Farming.


Wicks, Walter, 409 E. 29th St., Sioux Falls, S. D. Territory Inspector, Altec Service Corp.

1929

Battey, Lawrence, Salem, Mo. Dist. Ranger, Clark Natl. Forest.

Beveridge, W. M., 603 Bremen, Silver City, N. M. Supervisor, Gila Natl. Forest.


Christensen, I. L., Elkader, Iowa. SCS.


Morey, H. F., 111 Old Federal Bldg., Columbus, Ohio. Chief Div. of Flood Control, Centra1 State For. Exp. Sta.

Olson, R. W., P.O. Bldg., Portland, Oregon. Asst. Chief, Operations, Reg. 6, USFS.

Scholz, H. F., Box 265, Richland Center, Wisc. Silviculturist, Lake States For. Exp. Sta.

1930

Abell, Margaret Stoughton, Mt. Hebron, Calif. Housewife, Girl Scout Leader, School Trustee, Gardener.

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Morrison, K. E., 111 Old Federal Bldg., Columbus, Ohio. Forestier, Central States For. Exp. Sta. Photo Interpretation.


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Runkel, S. R., Box 630, Ottumwa, Iowa. District Conservationist. SCS.


1931

Benson, E. H., RFD No. 1, Randolf, Nebr.

Boerger, Harold, 676 E. Astor, Colville, Wash. District Farm Planner, SCS.


Chase, C. J., 1717 S.W. Delaware, Minneapolis 14, Minn. Lake States For. Exp. Sta.


Garver, R. D., 5822 Nevada Ave. N.W., Washington 15, D. C. Director, Forest Survey, U.S.S.


Houghton, J. P., Fall Creek, Ore. Forestier, Fall Creek Lumber Co.


Mooser, H. C., 1604 Morrison Ave., Louisville, Ky. Vice President, Gamble Bros.


Priester, F. T., 5964 Guthrie St., Los Angeles 34, Calif.

Robich, L. J., Appomattox, Va. 3CS.


Thielking, K. F., Albuquerque, N. M. State Forestier, SCS.

*Unser, G. L.


1932

Anderson, Helmer, Chippewa Falls, Wisconsin. SCS.


Dyksterhuis, E. J., 3342 Cleveland Ave. Univ. Place, Lincoln 4, Nebr. Chief, Range Div. SCS.


Hinkley, H. S., Sonora, Calif. 3CS.


Kline, George, Lone Tree, Iowa. Creameryman.

Potter, E. D., 606 Melrose Court, Clinton, Iowa. Flotist, Andrew Bather Co.

Schafer, A. O., Springfield, Mo. Staff Forestier, Mark Twain Natl. Forest.

Swanson, C. M., Bishop, Calif. Asst., Reg. Forestry Div. SCS.

1933


*Dunn, M. R.


Hart, E. D., 319 E. Harvard St., Gelandale 5, Calif. Chief Librarian, Glendale Public Library.

Henryson, E. L., Twin Valley, Minn. SCS.


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BJORNSON, H. B., 300 Home Park Blvd., Waterloo, Iowa. Pastor, First Baptist Church.

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GATES, E. W., Rt. 1, Shady Hills, Marion, Indiana. Sales Representative, Aetna Plywood & Veneer Co.

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GRAU, R. B., Box 157, Elkader, Iowa. Logging and Sawmilling, Northeast Iowa.

GUNDERSON, G. J., 106 S. Tennessee, Mason City, Iowa. Mason City Millwork Co.

HAUKOM, A. S., 307 Division St., Mauston, Wis. Wis. Cons. Dept.


HENRY, W. E., Breckenridge, Texas. Work Unit Conservationist, SCS.


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LIVERS, H. A., Neligh, Neb. SCS.


MERVIN, J. K., 3623 W. Roanoke Dr., Kansas City 2, Mo. Manager, Accounting Service, Westwood Retail Implement & Hdw. Assn., Kansas City, Mo.


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COOL, BINGHAM, Auburn, Alabama. Instructor, School of Forestry, Alabama Polytechnic Institute.


DAHL, E. A., 4121 Cornelia St., Chicago 41, Ill.

ECKHART, R. F., 413 Levin St., Hot Springs, Ark. Field Supt. Long-Bell Lbr. Co.

ELSON, W. E., 3143 N. Tripp Ave., Chicago 41, Ill.

FORST, R. B., Blooming Grove, Pa.


JENSEN, H. J., Box 472, Sterling, Texas. Resident Forester, Weyerhaeuser Timber Co.

KALLA, M. E., 3143 N. Tripp Ave., Chicago 41, Ill.

LANE, R. D., KRAJICEK, J. E., KELLER, H. H., 1071/i

LEWIS, E. A., 4121 Cornelia St., Chicago 41, Ill.

LUCK, BINGHAM, Auburn, Alabama.


MINOR, C. O., Univ. Sta., Box 18, Baton Rouge 3, La. Prof. of Forestry, Louisiana State Univ.


OELSCHLAEGER, G. E., 1248 Franklin, Lebanon, Ore. Engineer, Products Stds., Cascade Plywood Corp.

PARKER, C. W., 3512 37th St., Des Moines 10, Iowa.


PIZZANO, VINCENT, Rt. 1, Pownal, Vermont. Pres., Northeast Wood Products, Inc.

PORTER, M. A., Fayette, Iowa. Farmer.

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RUMMELL, R. S., P. O. Box 811, Wenatchee, Wash. Range Research, Pacific Northwest For. & Range Exp. Sta.

SCHNABEL, L. P., (Capt.), 2552 Leo St., Los Angeles 22, Calif. ROTC Instructor, Los Angeles High Schools.

SOMBERG, L. S., Box 173, Manning, S. C. Consulting Forester.

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WIESSE, J. E., 5916 W. 35th St., Kansas City, Mo. Mgr., Forest Products, Inc. Oak flooring plant.

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ANDERSON, K. M., 59 Eaton St., Lebanon, Ore. Production Standards Engineer, Cascades Plywood Corp.

BAMBER, M. F., USFS, Mapleton, Ore. Forester, Situlaw Natl. Forest.

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BELLEMORE, L. W., 512 Bilbo St., DeRidder, La. Pole and Piling Buyer and Inspector, Wood Preserving Div., Long-Bell Lbr. Co.

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HARRIS, R. B., Brookline, Pa.

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JENSEN, H. J., Box 472, Sterling City, Texas. Range Conservationist, SCS.


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LANE, R. D., 810 W. College St., Carbondale, Ill. Carbondale Branch, Central States For. Exp. Sta.

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<thead>
<tr>
<th><strong>SPRIGGS PHARMACY</strong></th>
<th><strong>Ames Stationers</strong></th>
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<tr>
<td>Prescriptions</td>
<td>Books—Greeting Cards</td>
</tr>
<tr>
<td>Our Specialty</td>
<td>Stationary</td>
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<tr>
<td>Fast-Reasonable-Service</td>
<td>Photo Supplies</td>
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<tr>
<td>2402 Lincoln Way</td>
<td>Typewriters</td>
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<tr>
<td>Ph. 1030</td>
<td>238 Main St.</td>
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<td>Campustown, Ames</td>
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<th><strong>MOORE'S DAIRY</strong></th>
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<tr>
<td>5th Ph. 369</td>
<td>D.-X. Lubricating Motor Fuel</td>
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<td>AMES, IOWA</td>
<td>Firestone Tires</td>
</tr>
<tr>
<td>MILK</td>
<td>and Accessories</td>
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<tr>
<td>CREAM</td>
<td>Complete One-Stop Service</td>
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<td>ICE CREAM</td>
<td>Main &amp; Burnett Phone 760</td>
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<tr>
<th><strong>Campus Cafe</strong></th>
<th><strong>Ames Wholesale Fruit and Grocery</strong></th>
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<td>MEALS—LUNCHEONS</td>
<td>Fresh Fruit</td>
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<td>FOUNTAIN SERVICE</td>
<td>Produce</td>
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<tr>
<td>2512 Lincoln Way</td>
<td>Meat</td>
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<td>Ames, Iowa</td>
<td>2nd and Elm Phone 84</td>
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<th><strong>Ames Hdwe. &amp; Music</strong></th>
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<tr>
<td>Hardware — Paint</td>
<td>PRESCRIPTIONS</td>
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<tr>
<td>Records — Music</td>
<td>CARDS — GIFTS</td>
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<tr>
<td>105 Welch — Phone 155J</td>
<td>COSMETICS</td>
</tr>
<tr>
<td></td>
<td>2430 L-Way</td>
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<td></td>
<td>Phone 1195</td>
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ECKSTEIN, J. H., Danube, Calif. Ivory Pine Co.
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RILEY, J. P., Lawrence, Massachusetts.
ROSEBOOM, W. B., 1414 Main, Rocky Valley, Iowa. Osmose Wood Preserving Co., Inspector.
RUSH, W. M., Churdan, Iowa. D. Milligan Lumber Co.
SIMON, HAROLD F., Ames, Iowa.
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<thead>
<tr>
<th>Business</th>
<th>Address</th>
<th>Phone</th>
</tr>
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<tbody>
<tr>
<td>Lloyd Motors</td>
<td>510 Lincoln Way</td>
<td>259</td>
</tr>
<tr>
<td>Mathison Motor Co.</td>
<td>323 5th Street</td>
<td>143</td>
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<tr>
<td>Skeie Motor Co.</td>
<td>202 S. Duff</td>
<td>2386</td>
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<td>Trow’s Super Service</td>
<td>3336 Lincoln Way</td>
<td>3001</td>
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<tr>
<td>Whattoff Motor Co.</td>
<td>118 Hayward</td>
<td>796</td>
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**BAKERY**

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<tr>
<th>Business</th>
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<tr>
<td>Purity Bakery</td>
<td>136 Main</td>
<td>206</td>
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**BOOKS**

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<thead>
<tr>
<th>Business</th>
<th>Address</th>
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<tr>
<td>College Book Store</td>
<td>Campus</td>
<td>Ext. 268</td>
</tr>
<tr>
<td>Student Supply Store</td>
<td>2424 Lincoln Way</td>
<td>164</td>
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**BUILDING AND LOAN**

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<tr>
<th>Business</th>
<th>Address</th>
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<tbody>
<tr>
<td>Ames Building and Loan Association</td>
<td>300 Main</td>
<td>81</td>
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**CLEANING**

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<tr>
<th>Business</th>
<th>Address</th>
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<tr>
<td>Ames Panatorium</td>
<td>410 Douglas</td>
<td>33</td>
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<tr>
<td>Lindquist Cleaners</td>
<td>120 Hayward</td>
<td>1700</td>
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**CLOTHING**

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<th>Business</th>
<th>Address</th>
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<tr>
<td>Berck’s</td>
<td>Sheldon-Munn Building</td>
<td>715</td>
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<td>Don Beam’s Menswear</td>
<td>312 Main</td>
<td>80</td>
</tr>
<tr>
<td>Jamesons</td>
<td>213 Main (Downtown Store)</td>
<td>92</td>
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<td></td>
<td>2540 Lincoln Way (College Store)</td>
<td>995</td>
</tr>
<tr>
<td>Joe’s Men’s Shop</td>
<td>212 Main</td>
<td>86</td>
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<td>2536 Lincoln Way</td>
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**DAIRY PRODUCTS**

<table>
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<tr>
<th>Business</th>
<th>Address</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Moore’s Dairy</td>
<td>428 5th Street</td>
<td>369</td>
</tr>
<tr>
<td>O’Neil Dairy</td>
<td>308 5th Street</td>
<td>62</td>
</tr>
<tr>
<td>Woodland Farm Dairy</td>
<td>819 Lincoln Way</td>
<td>435</td>
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**DRUGS**

<table>
<thead>
<tr>
<th>Business</th>
<th>Address</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Campus Drug</td>
<td>2430 Lincoln Way</td>
<td>1195</td>
</tr>
<tr>
<td>Sprigg’s Pharmacy</td>
<td>2402 Lincoln Way</td>
<td>1030</td>
</tr>
<tr>
<td>Peterson Drug Co.</td>
<td>2815 West Street</td>
<td>2865</td>
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**ENGRAVING**

<table>
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<tr>
<th>Business</th>
<th>Address</th>
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<tbody>
<tr>
<td>Ames Engraving Co.</td>
<td>Tribune Building</td>
<td>54</td>
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**FLOWERS**

<table>
<thead>
<tr>
<th>Business</th>
<th>Address</th>
<th>Phone</th>
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<tbody>
<tr>
<td>Evert’s Florists</td>
<td>208 Main</td>
<td>490</td>
</tr>
</tbody>
</table>

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</thead>
<tbody>
<tr>
<td>18-in.</td>
<td>$3.80</td>
<td>Delivered in U.S.A.</td>
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<tr>
<td>22-in.</td>
<td>4.25</td>
<td></td>
</tr>
<tr>
<td>24-in.</td>
<td>4.50</td>
<td></td>
</tr>
<tr>
<td>26-in.</td>
<td>4.80</td>
<td></td>
</tr>
</tbody>
</table>

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