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OF

IOWA STATE COLLEGE

AMES, IOWA
Ah. Wilderness, were paradise enow.
DEDICATION

Some time back in the dim days of peace, you decided to be a forester. Probably you don't even remember the exact reason—few of us do. Maybe you saw sunrise on a snow capped mountain. Maybe it was moonlight on the desert, or the smell of wood smoke in the autumn or the taste of maple sugar in the spring that first put the love of the woods in your blood. Or was it the white anger that surged up when you saw the waste and destruction of the woodlands that made you seize forestry as a weapon to stop the crime? It doesn't really matter; you became a forester—and were proud of it.

But now those things you know are gone—or locked up tight in some dark corner of your memory. You haven't much time for revery any more, except when the hours drag by on the night watch or the loneliness of far places presses too near. The forests were your past. Hell is your present. You can only work and fight and pray for your future.

To you, the foresters of the world, who sweat and bleed and die that justice and freedom may come a little sooner, we dedicate, with pride and humility, the Ames Forester of 1943. May it bring you back to the forest.
We are indebted to the above men for their cooperation and understanding.
<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedication—George Thomson .......................... 3</td>
</tr>
<tr>
<td>Southern Forest Opportunities—E. L. Demmon ........... 7</td>
</tr>
<tr>
<td>What Is Range Improvement—Lincoln Ellison .......... 15</td>
</tr>
<tr>
<td>Sociological Shackles on Forestry—H. T. Gisborne .... 23</td>
</tr>
<tr>
<td>Basic Concepts in Conservation—Ralph T. King ........ 29</td>
</tr>
<tr>
<td>Forestry in the Deep South—Arthur D. Read .......... 43</td>
</tr>
<tr>
<td>The Effect of Site Preparation on Survival and Growth of Selected Hardwood Species on Eroded Soils—J. M. Aikman 53</td>
</tr>
<tr>
<td>Mearns Cottontail Investigations in Iowa—Geo. Hendrickson 59</td>
</tr>
<tr>
<td>Wartime Marketing of the Products of Iowa Woodlands—Guy R. Ramsey .......... 75</td>
</tr>
<tr>
<td>Our Forests and the War—J. A. Larsen ............... 85</td>
</tr>
<tr>
<td>Presenting Lyle Watts—Bill Chilcote .................. 87</td>
</tr>
<tr>
<td>Faculty ............................................. 91</td>
</tr>
<tr>
<td>Seniors ............................................. 93</td>
</tr>
<tr>
<td>Underclassmen ....................................... 99</td>
</tr>
<tr>
<td>Forestry Club Activities—Bob McDermott .............. 107</td>
</tr>
<tr>
<td>Freshman Camp—Wally Adrian ......................... 110</td>
</tr>
<tr>
<td>Ames FORESTER Staff ................................ 115</td>
</tr>
<tr>
<td>Hell and High Timber ................................ 117</td>
</tr>
<tr>
<td>In Memoriam ........................................ 125</td>
</tr>
<tr>
<td>Alumni Section ...................................... 127</td>
</tr>
<tr>
<td>Advertisers .......................................... 143</td>
</tr>
</tbody>
</table>
Southern Forest Opportunities

BY E. L. DEMMON
Director, Southern Forest Experiment Station

No Section of the United States offers more favorable opportunities for forest culture than the South. Its 270 million acres of forest represents two-fifths of the commercial forest land of the entire nation. Proper development of this great natural resource will help to assure ample future wood supplies for the whole country, as well as furnishing continuous employment and an improved standard of living for many people in the region. Fortunately, the South offers many advantages for the maintenance of forest industries on a large scale. The soil and climate favor rapid tree growth; there are numerous valuable hardwood and softwood tree species native to the region; logging operations are relatively simple; all parts of the region are easily accessible to good rail and water transportation facilities; markets for forest products are generally good; ample labor is at hand; and industrial development is well under way.

When the first settlers came into the South the country was almost completely covered with forest. The clearing of land for agriculture and the establishment of communities and cities gradually reduced the forest area. It was not until the latter part of the nineteenth century, however, that commercial logging operations reached large-scale proportions. During the next half century, this nature-grown timber resource was so thoroughly exploited that today only a few remnants of the magnificent and inspiring old-growth forests remain.

The lumber industry in the South grew up on a cut-out-and-get-out basis. Operations were planned with the objective of liquidating the virgin timber and selling the cut-over lands for farming or livestock enterprises. No thought was given to the production of timber crops for the future or for operating sawmills on a continuous basis. As a result, large numbers of sawmills passed out of existence when the end of the original tim-

1 In this paper, the South refers to the 11 Southern States from North Carolina to Texas and Oklahoma.
ber resource was reached. Many thought that the great southern lumber industry would soon be a thing of the past. They did not reckon, however, on the fact that southern cut-over forest lands usually restock themselves naturally and, given half a chance, develop new commercial stands of timber.

Although little or no thought was given to the possibility of growing future crops of timber, the harvesting of the original forest benefited the South in many ways. It provided much-needed material for home-building, furniture, and the thousand and one other necessities of an expanding civilization; it gave employment to thousands of workers (even today southern forest industries employ more labor than any other activity except farming); it stimulated the building of railroads and other transportation facilities; it furnished revenues for the construction of schools, courthouses, and other public buildings. In addition, the cut-over lands opened new frontiers for farming and livestock enterprises. Some of the cut-over lands proved sufficiently fertile for permanent agriculture, but most people are surprised to learn that even now, after more than a century of effort to convert southern forest lands to farms, almost 60 percent of the total land area remains in forest.

USES OF SOUTHERN FOREST PRODUCTS

The most important industries depending upon southern forests for their raw material are those manufacturing lumber, naval stores, and wood pulp. Other important southern forest products include fuel wood, veneer, cooperage, poles, piling, posts, mine timbers, railroad cross ties, and chemical wood. Southern forest lands also support an important range livestock industry, provide a home for game animals, protect the soil from excessive erosion, exert a beneficial influence in conserving rainfall, in regulating streamflow and preventing floods, and afford opportunities for hunting and other recreational activities.

For many years the South has led the United States in the production of hardwood and softwood lumber. Of all the products cut from southern forests, lumber accounts for about 50 percent of the volume. At present there are more than 14,000 sawmills in operation in the South, employing the equivalent of about 250,000 full-time workers, including laborers in the woods.

The most important forest product next to lumber is fuel wood; about one-quarter of all the wood removed goes into this item. Railroad cross ties, telephone poles, cooperage, pulp-
wood, and other miscellaneous products consume the remaining quarter of the enormous volume of wood annually taken from southern forests.

The naval stores industry, which produces practically all of the rosin and turpentine used in this country and in normal times a large part of that used abroad, is centered in the long-leaf-slash pine forests of the Southeast. From 30,000 to 40,000 people are normally employed in this industry. The product is processed in approximately 1,000 gum turpentine stills and in 26 wood distillation plants using stumpwood.

Wood is the principal source of many kinds of pulp and paper products, so essential to our everyday life and to the war effort. In the South, the pulp and paper industry has rapidly expanded during the past decade. Investments of over $125,000,000 in pulp mills were made during that period and at present over 40 percent of all the pulp produced in the United States comes from the South. The value of pulp and paper produced in the South exceeds $200,000,000 annually. This industry employs more than 80,000 men on a year-round basis in both woods and mills. With normal paper consumption increasing in this country and with many foreign supplies shut off because of the war (before 1939, the United States imported more than half of its pulp and paper requirements, chiefly from Scandinavia and Canada), the opportunities for further growth of this industry in the South appear promising. How far this expansion can go, however, will be controlled by the quantity, quality, and availability of wood, the effect of competition for raw material supplies on other forest-products industries, and by the availability of financing. It is also contingent upon the maintenance of the South's marked advantages over other sections of the United States and foreign sources in regard to costs of pulpwood and other raw materials used, and of the manufacturing operations. An outstanding advantage to the southern pulp and paper industry is its nearness to supplies of chemicals used in the manufacturing processes.

Most of the southern pulp mills use the sulphate process of conversion, the bulk of the pulp being made into Kraft paper, bags, board, and containers. In the Kraft paper field the South produces over 80 percent of United States requirements and thus dominates the nation's markets. Until recently the white paper and miscellaneous pulp industries made up only a small part of southern paper production, but technical developments such as bleaching pine sulphate pulp or mixing pine and hardwood pulps have enabled a few southern mills to turn out the
better grades of white paper and board. Furthermore, of two large southern pulp mills which began operation in 1940, one is making sulphite pulp for rayon and the other produces newsprint, both using southern pine.

Altogether the primary forest industries in the South employ the equivalent of almost 500,000 full-time workers. In addition, there are many thousands of workers employed in truck, rail, and water transportation of forest products, in secondary wood-processing industries, in the care and protection of forest lands, and in service trades.

SOUTHERN FORESTS AND THE WAR

Southern forests are contributing generously to the war program in furnishing immense quantities of lumber needed for cantonment construction, for building factories, and homes for war workers; in the construction of bridges, ships, and docks; for wood for gunstocks; plywood for airplanes; wood and paperboard containers for the crating or boxing of munitions, machinery, food, and other war necessities; charcoal, turpentine, and rosin for use in flares, flame throwers and munitions; and cellulose for explosives. Because many large Army camps are located there, the South has been called upon to supply a large proportion of the increased construction needed. In many cases, these camps have been carved out of forest areas, and training maneuvers and bombing practice grounds have been centered in timbered sections.

The contribution of southern forests in the period of adjustment that will follow the war promises to be as important as its war contributions. Not only will they be called on to provide a plentiful supply of raw materials for a huge reconstruction program all over the world, but also they will be needed to maintain local industries and employ local labor.

PRESENT FOREST SITUATION

The existing forests of the 11 Southern States, according to a recently completed forest survey, cover almost 171 million acres and contain about 1½ billion cords, or 344 billion board feet, of merchantable timber. They are, in the main, young stands of rather thinly stocked second-growth of the same species and forest types that made up the original forests, much of it below the minimum size for most industrial uses. The trees range in age from seedlings to 40- and 50-year-old timber just reaching a size suitable for saw-timber use. While these young forests do not have the high quality of the original

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old-growth stands, they are able to supply most market needs. Only about 13 percent of the present forest area contains virgin growth.

The recent forest survey of the timber resources of the South made during the depression years disclosed that the region, from an over-all standpoint, was reducing its total wood volume almost as rapidly as it was being replaced through growth. In the saw-timber and higher-quality tree-sizes generally, saw timber was being cut faster than it was being grown. Far more serious, however, was the forest survey finding that southern forests are greatly understocked and growing at only about one-third of their productive capacity.

Uncontrolled fires, frequently set purposely, sweep over millions of acres of southern forests each year. Considerably more than half of the private forest area is not yet under organized fire protection. The average area burned over during the 4-year period, 1938-1941, according to a compilation made by the U. S. Forest Service, exceeded 26 million acres of State and private forest land annually, or 14 percent of the forest area needing protection. Twenty-three percent of the unprotected area burned annually in contrast to 2.4 percent of the protected area.

War demands have increased the amount of saw-timber cut from southern forests. Despite current overcutting, if the remaining timber resources in the South were being protected and well managed for future growth, the situation would be relatively favorable. However, protection and management practices are far from adequate. Small sawmill operations, which produce more than half of the lumber cut in the South, are particularly negligent in this respect. The South will not be able to balance the budget of increased timber needs in the future unless a constructive program of forest rehabilitation and industrial adjustment is worked out soon.

According to the 1940 Census, slightly over one-third of the total forest acreage of the South is owned by farmers. Approximately 7 percent is in national and State forests and other publicly owned forest land; the remaining 60 percent is divided among lumber companies, pulp and paper mills, banks, railroads, and other nonfarm owners. The ownership pattern is complex, which is a deterrent to the adoption and carrying through of a unified forest conservation program. But such unity must be achieved if forest production is to contribute its potential share to the future economic development of the region.

_Nineteen Forty-three_
FORESTRY PROGRESS IN THE SOUTH

Much progress has been made in southern forestry during the past two decades, probably more than in any other extensive forest region of the United States. A recent Forest Service estimate indicated that about 20 million acres of privately owned southern forest land were being managed with the objective of continuous timber production, involving the employment of many technically trained foresters. In addition, national, State, and other publicly owned forest lands under management in the South now total almost 14 million acres. Also, many farmers and other small landowners have taken steps to protect their lands from fire and have adopted conservative cutting and turpentining practices designed to increase and prolong forest yields.

Each southern State has contributed to forestry progress through an established State forest service as well as a State extension forester working under the Extension Service. Several Federal and State agencies are cooperating in extending aid to private forest owners for fire protection, planting, research, and in other ways.

A FORESTRY PROGRAM FOR THE FUTURE

If southern forests are to contribute their full share to increased prosperity, many obstacles must be overcome. A first step is to greatly increase efforts to protect these forests from fire, insects, disease, and destructive cutting. To eliminate needless fire losses, all forest lands, regardless of ownership, must be placed under organized fire protection at the earliest possible date. It is estimated that adequate fire protection of all State and privately owned forest lands in the South would cost over $8,000,000 annually, whereas present expenditures are only about a quarter of that amount. Increased provisions are also needed to assure early discovery and control of tree disease epidemics and invasions of destructive insect pests.

Although forest protection is essential, it is only the starting point for good forestry. To obtain a crop of timber by good forest protection is of no permanent value if the productivity of an area is seriously curtailed or ruined by improper or destructive cutting. Sufficient information as to proper and practicable cutting practices is available for all major southern forest types so that there is no reason for delaying their application. Good forest management is just good business. It is therefore important to make sure that southern forests in all ownerships, whether public or private, are well managed.
There is need, also, for much additional information to provide the scientific basis for growing continuous crops of timber, and this can best be obtained through an adequate program of forest research. Present forest research efforts in the South fall far short of actual needs.

Many millions of acres of southern forest lands are in need of planting if they are to grow timber crops within any reasonable period and adequately safeguard soil and water resources.

Other provisions needed for a sound forest program involve the removal or amelioration of obstacles to stabilized ownership necessary for long-time forest management, including discriminatory taxes, unfair freight rates, and unfavorable credit facilities.

The major forestry problems which confront the South cannot be solved by one group or another alone. The people who work in the forests and for the forest industries, as well as those who live in the communities and cities dependent in whole or in part on the forest resource, have as much at stake in the continuity of forest production as does the man who owns or operates forest land. Since forests are so important to the local, regional, and national economy, public interest must demand the conservation and wise use of these resources. Where private owners are unable to profitably operate their forest land, the public should acquire and manage it. However, if private owners are unwilling to protect and use the resource wisely, some public control measures will be necessary.

Federal and State agencies have contributed much to southern forestry progress in the way of education, research, fire prevention and control, demonstration, and technical guidance. Such aids need to be greatly expanded and strengthened.

Increased public ownership of forest lands by municipalities, counties, States, and the Federal Government seems to offer the best means (1) to restore clear-cut, depleted forest lands and submarginal and worn-out agricultural lands to productivity; (2) to protect certain vital watersheds in the best public interest; and (3) to test and demonstrate proper forest management practices. In the South, there are between 11 and 12 million acres of forest land in public ownership, or about 7 percent of the total forested area of the region. Even if public ownership were extended to three or four times this area, as may eventually be desirable for the purposes stated above, it still leaves the great bulk of the forestry job to the private owners.

The South stands on the threshold of an era wherein its great
human resources and its capacity for the production of raw materials are available to achieve greater security and prosperity for its people. All prospects point to increased industrialization of the South. Such industrial expansion must be based on a large and continuous supply of raw materials. Southern forest resources, occupying about 6 out of every 10 acres of its present land area, can and should play a major role. The South has a matchless opportunity—she can at one and the same time make her forests more effective in helping to win the war and the peace.

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SLABS OF THE SUNBURNED WEST

An arm-chair for a one-eyed giant;
two pine trees grow in the left arm of the chair;
a bluejay shoots and twitters . . . out and across . . .
tumbled skyscrapers and wrecked battleships,
walls of crucifixions and wedding breakfasts;
ruin, ruin—a brute gnashed, dug, kept on—
kept on and quit: and this is It.
Falling away, the brute is working.
Sheets of white veils cross a woman’s face
An eye socket glooms and wonders.
The brute hangs his head and drags on to the job.
The mother of mist and light and air murmurs. Wait.

—Carl Sandburg
What Is Range Improvement?

LINCOLN ELLISON

Intermountain Forest and Range Experiment Station, Ogden, Utah

The term "range improvement" is used very freely, but it is seldom defined. The term might appear to be so easily understood as to make definition unnecessary, yet its great variation in significance, as used by range managers in reports of range condition, makes clear that the term means different things to different men. Some consideration of its significance is therefore in order.

We know in a general way what range managers have in mind when they speak of improvement—such as an increase in plant density, an increase in the abundance of the more palatable species, the "healing" of gullies, etc. Perhaps the most unquestionable evidence of improvement is considered to be the appearance of species higher in the normal succession and the disappearance of species representing lower stages. Improvement of the soil is referred to rather incidentally, for if improvement of the soil is considered at all, it is generally assumed to accompany improvement of the vegetation. This, however, is not necessarily true, as will be shown presently.

Broad-scale ecological studies show that the two processes, soil formation and the development of vegetation, are interdependent, that over centuries a deep soil will develop from raw parent material, and at the same time progressive changes of vegetation and animal life take place. The two processes are so interlocked in complexity that each is both an effect and a cause of the other.

There is no reason to believe that the two processes may not seem to be independent for short periods, however. The following example, taken from high summer range on the Wasatch Plateau in central Utah, will illustrate the point.

The range under consideration is at an elevation of 10,000 feet. The wind is frequently strong and evaporation is rapid. Beginning about November 1 the ground is covered by snow, which lies very deep during the winter so that the soil is
not frozen except shallowly in fall and spring. The snow, which on the average contains some 2 feet of water, three-fourths of the annual precipitation of 30 inches, is usually gone about the last week in May. The precipitation in summer is highly erratic in distribution and frequently falls violently, running over and eroding the exposed ground surface. The rills and gullies cut by these summer rains are deepened during the period of snow melting in spring. Active vegetal growth begins as soon as the snow melts, and, unless stimulated by fall rains, is completed toward the end of September. The growing season, then, lasts about 4 months, but it is usually shorter because of cold weather in spring or fall, or because of summer drought.

These climactic conditions have important implications for the range manager. Because the growing season is short, plants do not have much time to recover the vigor which may be impaired in cropping; the maturing of viable seed is not always possible; the seed may be washed away or fall on a sterile subsoil surface bared by summer storms; and the seedling, once it gets its roots into the soil, has all these factors to contend with, in addition to drought and trampling by livestock. It is little wonder, then, that some of these high ranges revegetate slowly.

The square-meter quadrat chosen for an example lies on a slight ridge on a slope of 20 percent, with a western exposure. The soil is a clay. Other plot records and photographs show that the quadrat is fairly representative of the entire slope. The area is grazed primarily by sheep, but also by a few cattle, from early in August to about the middle of October. The intensity of grazing is now very much less than it was prior to 1916, when the quadrat was established on range badly depleted from excessive use.

Figure 1 shows the quadrat as it appeared in 1919 and 21 years later in 1940; and table 1 summarizes the vegetal changes numerically. For the sake of simplicity, the results from chartings between 1919 and 1940 are not shown; despite the inevitable minor fluctuations from year to year they substantiate the trends suggested by the end figures, and so these alone are used.

In 1919 the predominant species was *Achillea*, and in 1940 *Agropyron*, a very great difference as the photographs show. The outstanding vegetal changes have been the invasion of the grasses, particularly *Agropyron*, and of *Vicia* and *Pseudocymopterus*, and an increase in the importance of *Taraxacum*. The absence of ruderals in 1940 is accidental, for they were present
Fig. 1a. Quadrat as it appeared in 1919.

Fig. 1b. Same quadrat as Fig. 1a taken 21 years later. 1940.
nearby in 1940 and were recorded on the quadrat the next year.

Soil changes are not so easy to describe, for records of soil condition are meager. The soil surface in 1919, as shown in the photograph, was largely exposed to the elements and was no doubt eroding rapidly. At the same time some deposition on the quadrat may have been taking place, for the slope above was eroded down to the rock; but even so, most of the eroded material probably was carried farther down the slope, so that the net change on the quadrat was a loss of soil.

| TABLE 1 |
| Number of shoots, by species, on the same square-meter quadrat in 1919 and 1940 |

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<thead>
<tr>
<th>Species</th>
<th>1919</th>
<th>1940</th>
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<tr>
<td><em>Agropyron trachycaulum</em> (slender wheatgrass)</td>
<td></td>
<td>412</td>
</tr>
<tr>
<td><em>Sisyrinchium</em> (Letterson needlegrass)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><em>Achillea lanulosa</em> (western yarrow)</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td><em>Taraxacum officinale</em> (common dandelion)</td>
<td></td>
<td>85</td>
</tr>
<tr>
<td><em>Vicia americana</em> (American vetch)</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><em>Pseudocymopterus montanus</em></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><em>Polygonum douglasii</em> (Douglas knotweed)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><em>Lepidium ramosum</em> (pepperweed)</td>
<td></td>
<td>3</td>
</tr>
</tbody>
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1 In 1916 when the quadrat was established the composition was much like that in 1919: *Achillea* 98, *Taraxacum* 2, *Polygonum* 4, and *Chenopodium album* 4 shoots. The occurrence of the rhizomatous *Achillea* on a particular quadrat may be very erratic. Its significance, whether in 1916 when 98 shoots were recorded on the quadrat, or in 1919 when only 3 shoots were recorded, is that it was the predominant species at that time.

The pedestaled grasses in the 1940 photograph suggest further soil loss. Soil pedestals may of course be formed by deposition as well as by erosion, or by a combination of the two processes, so that it is necessary to examine pedestals closely to interpret their significance. On this area the pedestals probably represent soil remnants: not more than a third to a fourth of their height of 3 inches looks like deposited material, while the exposed roots and dying plants, as in the pedestal just left of the center of the quadrat in the 1940 picture, testify to removal of soil. This pedestal was the remnant of a grass clump which gained a foothold sometime between 1929 and 1932. It supported 2 living shoots in 1940 when the picture was taken, and within the ensuing year it disappeared. The raw surface and the gullied character of the area as a whole further substantiate these evidences of soil loss.

Something as to the rate of loss may be ascertained from a
knowledge of the age of the grass clumps. Grasses first appeared on the quadrat between the chartings of 1927 and 1929. The oldest plants still existing in 1940 appeared sometime between the chartings of 1929 and 1932. If we assume, for the sake of a definite date, that they appeared in 1930, then there has been a net soil loss of some 2 inches in 10 years, if we estimate, conservatively, that two-thirds of the pedestal height represents eroded material. Actually the loss has probably been greater, for the hummocks have themselves been subject to some erosion.

It is not important for our purpose to measure exactly the soil loss between the times the pictures were taken, nor to know how much soil had been lost before 1919. The evidence is sufficient to show that the soil surface has been very unstable. This instability may explain in large measure why the plant population in 1940 is no greater, for it is clearly to be seen from the photograph that the ground cover is still very scant. Yet, by many criteria, the range has “improved,” for the plant density and the proportion of palatable species have increased, and so far as the gross features of the vegetation may be used as a guide, progressive succession seems to have taken place.

This is indeed a paradox. It is not a special case: on sloping mountain lands this phenomenon is by no means uncommon, and if adequate records were available it would probably be more generally recognized. On the one hand we have an improvement in vegetation, but on the other hand and at the same time, we have a depletion of soil—two antagonistic processes occurring side by side! It is not to be supposed that this situation can continue indefinitely, for unless the soil loss is checked there will be nothing left but raw parent material, and on such a substratum little vegetation will be able to exist. But for a short time soil and vegetation are clearly out of step, the one going forward, and the other backward.

How, by any process of ecological rationalization, is this paradox to be explained? We must first clarify our concept of biotic succession. Without going into a detailed discussion, it should be pointed out that the normal successional process from bare area to climax, is exceedingly complex. Involved in it are not only a succession of the higher plants and animals, but an intricate succession of microfloras and microfaunas, a succession of chemical and physical characteristics of the soil involving structure, aeration and water relations, and a succession of microclimates near the soil surface.
In speaking of "plant succession" all the less apparent phases of the process are properly implied; but it must not be assumed, because certain superficial changes have been observed, like the rise of grass on our quadrat, that all the other essential changes have taken place also. Considering the absence of organic matter in the topsoil and the absence of litter on the soil surface, as well as the presence of extensive bare spaces between the plants, over which the vegetation is able to exert but little influence, it is obvious that the concomitant changes in progression toward a climax are definitely lacking.

There need be no mystery about the invasion of _Agropyron_ directly onto this depleted soil, even though this grass is considered by some to characterize the herbaceous climax. Given a seed source—which presumably a change in grazing practice permitted in the early 1900's—some management and good luck, there is no reason why _Agropyron_ shouldn't become established. After all, given management and good luck, it can be successfully seeded artificially. It seems obvious that the potentialities of the soil were sufficient in 1916 and 1919 to have supported _Agropyron_ had seen been available and had conditions for establishment been favorable. Similarly, the appearance or increase of the other species—_Stipa, Taraxacum, Vicia_, and _Pseudocymopterus_—need be explained by no occult evolution, but simply by a combination of lessened grazing pressure which permitted seed to be produced and by favorable micro-environmental conditions which permitted seedlings to become established.

The paradox, then is only apparent. There has been succession in the broad sense that changes have taken place, but in the restricted sense of constructive change, change toward a deeper, richer, more productive soil and more abundant vegetation, the trend has been essentially retrogressive.

The idea has become current, unfortunately, that certain plants are unquestionable indicators of successional status. But in so complex a system no single indicator is infallible, and if he depends upon any one alone, the range manager may be misled by appearances. If the range manager, looking at the 1940 photograph, supposes he is looking at the herbaceous climax reached after centuries of slow soil building, simply because of the predominance of _Agropyron_, he is ignoring the glaring absence of supportive evidence in the raw, eroding soil surface, the lack of litter, and the general sparsity of cover. Any successional stage is not indicated by some certain plant

_Ames Forester_
alone or group of plants, but by the entire complex, of which those plants are but a part. It is this complex, involving both soil and vegetation, that must be generally recognized if range management is to become a science.

Let us return to the original question, what is range improvement? Under certain circumstances it may be simply an increased productivity of forage. These circumstances are probably rare. Even in the grazing of meadows not subject to erosion there is likely to be a depletion of mineral salts in time, which must be replaced if productivity is to be maintained. In the example we have used, the grazing capacity is certainly greater in 1940 than 1919, and the range manager who considered the vegetation alone, overlooking the soil, would conclude that great improvement had taken place.

Unfortunately it is very easy to overlook the loss of soil, for when the surface is scarred and some soil is carried away, a host of natural processes operate to erase the signs of loss. The ground surface is astonishingly mobile, especially on slopes, and after a short time the action of freezing and thawing, swelling and shrinking, the penetration, expansion, and death of numberless roots, the burrowings of numberless soil organisms, and the trampling of grazing animals, all operate to smooth out inequalities. The observer has almost no way of telling how much loss has taken place, except crudely under special circumstances, with the help of such phenomena as pedestaled plants or exposed root crowns. Even these indications may last only a short time under continuing erosion.

However difficult the detection of soil change may be, a way must be found to do it, for an appraisal of soil condition should enter any sound estimate of range improvement. Perhaps the soil should be the major criterion—the soil after all, is the capital resource and the vegetation only the interest on that capital. Perhaps an evaluation can be made by integrating the conditions of soil and vegetation, considering a certain advancement of vegetation to be of equal value to a certain loss of soil. Perhaps relative rates of soil loss can be used. In our example it might be argued that the rate of loss in 1940 is less than it was in 1919, since the vegetal cover is better, and that therefore an improvement of the range has actually taken place. To use this argument, however, one must be assured that the decrease is sufficiently rapid so that stability is in sight, which does not seem to be the case in our example. Otherwise, what is to prevent ultimate disaster?

Nineteen Forty-three
I am not offering an answer; I am not defining "range improvement"; I am simply raising the question. It would almost seem that, before we know what range improvement is, we must know a great deal more about range ecology. We must comprehend the physiological basis for succession as well as the physiological response of plants in the varied range environment. We must understand the role played by the multitudes of accessory organisms, in the soil and on the surface, which indirectly affect the range through their influence on the soil and on the vegetation. We must understand the details more completely than we do now, of the processes of soil formation and soil loss. We need some means of measuring soil stability, and as stated above, we need a means of synthesizing our knowledge into an estimate of range condition. It is clear, then, that range management is no cut-and-dried affair with all procedures worked out in detail and described in bulletins and text books. Rather, the difficulties of getting the necessary information are sufficiently great so that it may be said with certainty that the solving of the most important problems of range research and range management is still reserved for the future.
FEW people, even foresters, think of forestry as influenced by sociological knowledge, principles, or activity. Actually, the practice of forestry is not only for the development of society; it is also being retarded by a lack of sociological concepts which the sociologists, not foresters, should enunciate.

More than 55 years ago that keen observer, Rudyard Kipling, saw the condition and stated the case about as clearly as anyone has ever since done it. In 1889, Kipling took a cross-country look at our American way of life and wrote:

"The great American Nation—which individually never shuts a door behind its noble self—very seldom attempts to put back anything that it has taken from Nature's shelves. It grabs all it can and moves on. But the moving on is nearly finished and the grabbing must stop; and then the federal government will have to establish a Woods and Forests Department the like of which was never seen in the world before. And all the people who have been accustomed to hack, mangle, and burn timber as they please will object, with shouts and protestations, to those infringements of their 'rights'."

Obviously Kipling saw the dependence of our society upon our forests. He saw this clearly because he was already "forestry-wise." He saw too the future dependence of successful forestry on socio-political action, for he was socially and politically wise.

About 15 years later, in 1906, when Secretary of Agriculture James Wilson transferred the old Forest Reserves from a preservation status into National Forests on a use basis, he too saw the social significance of our forests. And he took political action to make those forests serve those social uses. In his transfer order he stated specifically that each of these National Forests should serve for the welfare of the community.

NNineteen Forty-three
Forests henceforth should be put to "its most productive use for the permanent good of the whole people and not for the temporary benefit of individuals or companies." Here was sociological and political action of the first order. More than 100 million acres of land were affected. Three times as much forest land, however, and the most productive by far, still remained outside the realm of this social order, in private ownership.

But about 10 years after Wilson's order and 25 years after Kipling foresaw this social development, Gifford Pinchot made a remarkable observation. He stated, in his book "The Training of a Forester," that in his opinion the entire profession of forestry had in reality adopted the definitely social axiom, "For the greatest good of the greatest number in the long run." He added, "Before the members of any other profession dealing with natural resources, the foresters acquired the long look ahead." That this was aimed directly and specifically at PEOPLE and not just things is clearly evident in an article published in 1916 by one of the District Foresters then serving under H. S. Graves who followed Pinchot as Chief. That District Forester, Coert DuBois, was perhaps the first to state the federal forestry objective with emphasis on the sociological benefit. In his article, "The Mountain Communities and the Forest Service" (Univ. of Cal. Jour. of Agriculture, Vol. IV, No. 3, Nov. 1916), DuBois used photographs and text to illustrate the fact that "The Forest Service works with FOLKS as well as with trees and trails" and "These are the people for whom the Forest Service is working." That was 27 years ago. The sociological objective has never changed.

But then came a long lag in new activities relating forestry to sociology. The advent of the Civilian Conservation Corps in 1933, however, broke this lag. It broke it with a procedure which was a social as well as an economic measure. The relationship was exceptionally direct: life in the forests would be good for the boys; their work would be good for forests. After nine years of trial, both of these benefits are almost universally conceded.

During that nine-year period, other progress and one marked change also became evident. On privately owned forest lands the "Tree Farm" idea was born and began to be put into practice. While some of this may have resulted from certain pressures, most of it undoubtedly can be attributed to the firm belief by all professional foresters that forestry should be "for the greatest good of the greatest number in the long run."
Many lumbermen and private timberland owners know all the workable techniques of forestry. And they know the forester's maxim, perhaps ad nauseam. Nearly all the large owners and operators also have technically trained foresters in their employ, some of these men being in high executive positions. At least in the backs of their minds, and frequently in their forest management practices, these men inescapably felt and frequently showed their belief in the social maxim, "For the greatest good of the greatest number in the long run."

Some progress has been evident, but if in 1942 Kipling should have remade his trip and rewritten his book "From Sea to Sea," it is doubtful if he would have greatly changed his sociological observation of 53 years before. He would have seen that on at least one-half of our forest land, and probably more, "the great American nation" was still not succeeding in its attempt "to put back anything that it has taken from Nature's shelves."

If Kipling had reached this conclusion in 1942, he might have tossed another "rag and a bone and a hank of hair" at the sociologists and the great American Public. For without even a trip from sea to sea he would have observed almost anywhere in the United States the great change that has taken place in the familiarity of our sociologists and the people in general with our forest conditions and our forest problem. He would have wondered how they could see so much but do so little. As Ellison has pointed out in the August 1942 issue of the Journal of Forestry, the number of annual visitors to the National Forests now practically equals the total population of this country. While this does not mean that every member of the populace has a chance to see either what is being done to or for our forests, Kipling might have wondered how so many people could look and still not see enough to cause them to act. He might, with reason, have asked the sociologists what they DO with their knowledge of "the phenomena and development of society."

Obviously any social phenomenon involving a number of people equivalent to the total population of a country should constitute a development worth more than mere study. Kipling might have said, "I told you 50 years ago what was going to happen. Now practically all of you have seen it with your own eyes. What are you going to DO about it? Persist in those all-American attributes of 'passing the buck' and 'let George do it,' or buckle down and DO something?"

But these evidences of inertia are not the only shackles
hung on forestry and foresters by the students and leaders of the constitution and development of society. They, the leaders, definitely expect the forester to give "adequate protection" to their forests from fire, insects, and disease. But they give him no definition whatever of "adequate"! Engineers have a rule which they can follow: The cost of the dike, the cost of the storm sewers, must not greatly exceed the cost of the city structures which the dike and the sewers protect from flood damage. Such values can be approximated satisfactorily. But the forester may be protecting a recreational area heavily used by the public. That area has a social re-creational value by reason of its trees and brush, rocks and rills. Burn off the trees and brush and what is the social value remaining? Should the forester evaluate this social loss? Or is that the function of the sociologist who studies the phenomenon of 132 million visitors to the National Forests, nearly 500,000 annually to one National Park?

Out on the ground, the Forest or Park ranger is frankly spending all the money he can get to protect these forest values for the public. And in almost all cases he can show you that the funds available are not enough if you want to avoid large and recreationally ruinous fire scars on your favorite landscape following the next critical fire season. In a few cases (see Koch's "The Passing of the Lolo Trail" in the Journal of Forestry, February 1935), experienced foresters not only admit that enough money is available but claim that too much has been spent, considering the type of forest resource at stake. But Koch is a white pine silviculturist, a saw-log forester. Should he assess the value of that highly recreational, highly historical Lolo trail? Earl Loveridge, another experienced forester, says "No," the "costs of real protection in this country are justified by he true values." Should Loveridge therefore assess these values?

If the destructible forest benefits and values are primarily sociological, what do the sociologists say? So far—nothing, just nothing!

In the meantime the ranger and his supervisor, and all foresters in general, are trying their best to manage these forests for the greatest good of the greatest number in the long run. But they are forced to do this, shackled by a total lack of interpretation of the key word, "adequate." They dedicate their work and their lives to a sociological axiom, but when cases arise demanding specific interpretation, the sociologists

Ames Forester
are conspicuous by their absence. They seem to say, "Let George, the forester, do it all."

Many other cases could be cited, such as the costs justifiable to develop the forests in those ways for which the American Youth Commission commended the Forest Service and the Park Service in its recent report "Youth and the Future." Other cases also could be anticipated which are certain to arise in the future, such as maintaining public support for any forestry measure if the Forest Service succeeds in its avowed objective of a philosophy of plenty. IF foresters should be successful in producing plenty of timber, livestock forage, wildlife, recreational settings, and clean forest waters, how long will it be before politicians and the public erroneously reason, "Well, if they are doing so well in their work, that is prima-facie evidence that they are getting too much money. We will reduce their appropriations until they don't do so well."

Present day students of both forestry and sociology might find in this problem and project a highly profitable field for productive specialization.

Supervisors of high school education also might well follow the lead of the High School Supervisor for the State of Montana who has recently recommended that a comprehensive forest conservation course be taught in conjunction with the present courses in "Sociology" or "Problems of American Democracy." Sociology and Forestry are inseparable. Either one can shackle the other. But as long as foresters follow the maxim first stated by Wilson, refined by Silcox, pushed by Clapp, and most recently restated by the newest Chief of the Forest Service, Lyle F. Watts (Iowa, B.S.F. '13, M.S.F. '28), the sociologists do not need to fear social impediments imposed by the foresters. As Watts put it, in his first word of greetings to his organization, "You and I have a lot to do with trees in the forest and in the farm woods; with forage on open ranges and in pastures, with wildlife, and with soil erosion and the like . . . I am confident that we all think and work with these things because they are tools through which PEOPLE may be served . . . I know what happens to PEOPLE in forest communities after their timber has been liquidated improperly or too fast . . . forest land resources can bring reasonable security to PEOPLE who work in a given locality and who want to own HOMES and raise FAMILIES."

As is evident, Forestry has become one form of applied

*Nineteen Forty-three*
sociology. Foresters are actually DOING something about it. Sociologists could help, if they would, by defining the social objectives which they want foresters to achieve but not exceed.

DUST OF SNOW

The way a crow
Shook down on me
The dust of snow
From a hemlock tree

Has given my heart
A change of mood
And saved some part
Of a day I had rued.

—Robert Frost
WHENEVER wildlife conservation is discussed there is usually almost unanimous agreement that education offers the best if not the only solution to many of the conservation problems still only partly solved. This in spite of the fact that during the past fifteen years our colleges and universities have been turning out scores of wildlife technicians each year. During this same period the grade and high schools have included more and more conservation teaching in their curricula, and every other educational medium has been used to some extent to present the principles and preach the practices of conservation.

There are three aspects of this teaching. These are, first, the technical training provided in universities and colleges for those students preparing themselves for the profession of wildlife management; second, the less technical and generally less specialized knowledge of conservation imparted to students of all ages from the lower grades to the graduate level; and third, the admixture of conservation ideas and ideals, facts and fancies, much of which is very good and some of which is very bad, that is supplied the public through the medium of newspapers, magazines, pamphlets, books, and radio.

This widespread interest in conservation is a potentially powerful force. If properly harnessed and directed it can be productive of much good. If it is not harnessed it will be largely dissipated, and if it is not directed it will accomplish relatively little good and may do a great deal of harm. To the degree that our conservation efforts are successful it will be increased and intensified. Certainly it should be fostered and encouraged, but just as certainly as it develops into a strong force it should be molded into a good force and directed toward the most worthwhile ends.
The responsibility for molding and directing this growing force rests upon those of us who have elected to make conservation our profession. It is the greatest contribution that education can make to the future progress and development of conservation, and it is a contribution that not only permits but actually requires the participation of every individual in the profession. Whether our participation is willing or reluctant, informed or otherwise, it is bound to be effective. Effective for good in the one case, for evil in the other.

Textbooks, technical papers, and professional reports are obviously a part of this participation. Popular articles, radio talks, addresses before lay audiences, and newspaper comments and interviews are just as certainly another part. In some respects these activities mentioned last are more valuable, possess more possibilities for good, than those mentioned first. They reach a larger audience, one more in need of education, one that is perhaps less receptive and is certainly less able to assimilate what is offered, and one that is less critical.

If, then, each of us must participate in this process of education, and if all of us, layman and professional conservationist alike, are involved in this business of conservation it seems we could well afford to examine our education and conservation aims to determine if we are pulling together or against each other. This presupposes some general agreement on ends to be attained. In so far as our educational program is concerned those ends should not be difficult to define. They, however, should be clearly defined and reexamined frequently in order that this general agreement will be insured, and to prevent our losing sight of primary objectives. This will make for less confusion in the minds of the public and less conflict among ourselves.

Conservation education outside of the professional field should not be primarily concerned with techniques. Its chief concern should be the development of a proper attitude toward the earth and its resources, a philosophy of life that is based as much on man’s relations to and involvement in earth’s phenomena and resources as it is on his dependence on and opportunity to use these forces and materials. This philosophy must be in some part practical because of man’s need for the very things he is seeking to conserve. To this extent conservation education should include training in techniques; these, however, should be management techniques. The development of a proper attitude is dependent upon an understanding of the
principles that must govern our treatment of these resources if we are to use them and at the same time insure their continued existence. There can be no understanding of these principles without first understanding the fundamental nature of the resources we are dealing with.

The following basic concepts are sufficient to clearly explain the fundamental nature of the wildlife resource and enable us to derive the principles that must govern its conservation and management. An understanding of these concepts might well serve as the objective of our educational program. Until the conservation public understands them there is little hope for a unification of effort, and when they are understood direction of effort will be much less difficult.

THE ORGANIC NATURE OF THE WILDLIFE RESOURCE

The first and most important of these basic concepts is the organic nature of the wildlife resource. Simply because wild animals are living creatures those of us with biological training have assumed that the general public is fully aware of or can readily grasp the distinction between organic and inorganic resources, and the full significance of this difference. We have been wrong on both counts. The widespread tendency to confuse management with "farming" or even with "mining" is proof that a serious misconception still prevails.

Professionally we have put our faith in management. Obviously we are convinced that we are dealing with a manageable resource. Its manageability is inherent in its organic nature and possible only because of this nature. We have not, however, taken the time or the pains to explain this to the layman. He will never fully comprehend the techniques of management, and he can have little appreciation of its possibilities and no conception of its results until he understands the one thing that makes management possible. This single concept is so all-inclusive that certain of its components must be considered separately and their importance accorded special emphasis. In its entirety, however, it constitutes the very basis of any understanding of the wildlife resource and its conservation. It is only when one is able to grasp the full significance of the organic nature of the resource that one can conceive of its management on a sustained yield basis. Management is necessary if conservation is to provide for using the resource while at the same time providing for its continued maintenance.

Nineteen Forty-three
THE VARIOUS VALUES OF THE WILDLIFE RESOURCE

The second basic concept has to do with the various values of wildlife. The total economic value of this resource is the sum of its several values plus the worth of the several services it performs. The more general values may be listed as follows: commercial, recreational, biological, social, esthetic, and scientific. Failure to understand and appreciate these several values has been and still is a retarding influence. There are two ways in which this influence manifests itself. First, because many people are unaware of the total value of the resource they are not convinced that money, time, and effort devoted to wildlife conservation is a justifiable expenditure. Second, most individuals recognize only one, or at most two or three of these values, and insist that the ones they do recognize be given primary, if not exclusive, consideration. This has led to the unfortunate situation wherein various organized groups, all intensely interested in wildlife conservation, advocate and demand conservation programs that are antagonistic to each other, incomplete in their provisions, and likely to do more harm than good should they be enacted.

It is hardly to be expected that there will be any marked improvement in the public's attitude in this respect until it is aware of the various values possessed by wild animals, and the various services performed by them. Appreciation of these values would undoubtedly make for greater harmony between these organized groups, and probably make it somewhat less difficult to obtain the funds necessary for conservation work. It is logical to assume that the public is not going to become enthusiastic about something it doesn't understand, and it is is equally logical to assume that it will be less reluctant about approving conservation appropriations and will more wholeheartedly support a conservation program if it is convinced that the value of the resource and the returns to be realized from it are sufficient to justify the investment.

THE DYNAMIC NATURE OF ENVIRONMENTS

It must be realized by every individual in any way responsible for conservation practices that all wildlife conservation is wholly dependent upon the provision of satisfactory environments, for all wild animals are totally dependent upon the environments in which they live. Every need of the individual and the species must be supplied by the environment; if the environment provides poorly wildlife will be scarce, and if it
provides not at all, even in the case of a single need, wildlife will not exist there. It must therefore be made clear each environment has to provide that great variety of foods, coverts, water, and special factors needed during the different seasons for the various activities of both sexes and all age groups of all the species it is intended that the environment shall support; and that this applies not only to the materials necessary for the animals’ physical well-being but also to the pattern or arrangement of these materials suited to the animals’ physical abilities.

This concept of the environment, however, is not complete and will not render understandable the methods and results of conservation unless it includes an appreciation of the dynamic nature of environments. Both the methods and the results of conservation will be much easier to understand if we can conceive of environments not as things static and having only linear dimensions, but as things happening and in a state of constant change. Each environment has both a past and a future, not merely horizontal extension; at any given time it may be in a condition of stress, in the process of adjustment, or in relative equilibrium. Progression through these stages or from one stage to another is ordinarily an orderly series of changes constituting a natural succession. It is frequently necessary in conservation to hasten, retard, or even reverse succession. Once a desired stage has been attained it is necessary to retard succession on the area in question or have available other areas approaching the same stage. For these and other reasons a clear conception of succession and the dynamics of environments is essential to any real understanding of wildlife conservation.

THE NATURE OF ANIMAL ORGANISMS

We must know something of the fundamental life processes going on within animals. This much, at least, is necessary before we can account for their behavior, supply their essential needs, and anticipate their actions.

In so far as the basic substance of life is concerned all animals are essentially alike. Although there is a continuous stream of matter and energy flowing through the living individual, there is nevertheless a remarkable similarity in the fundamental factors of this living matter, whatever its source. Confirming evidence from many sources has long since established the full physiological significance of the essentially similar fundamental, living material of all organisms.

In this one basic respect all animals are alike; therefore, the
biology of all animals is to a large degree similar and it must follow that the requirements of all animals are to that same degree similar. This likeness is the more remarkable because they have to meet very different situations. They must accomplish the same ends, and even though they do so in a variety of ways the differences are more apparent than real.

In every living organism there is constant and continuous need for new matter from which to derive energy and to supply materials necessary for growth and replacement. Although the identity of the individual is maintained and its relations to its environment are continued it is, nevertheless, in a state of constant change—never the same in any two periods of time or in any two places in its environment. Jennings has expressed this idea as follows: "It is of the utmost importance, if we are to understand the behavior of organisms, that we think of them as dynamic—as processes rather than structures. The animal is something happening."

**THE UNIVERSAL APPLICATION OF BIOLOGICAL LAWS**

In our efforts to conserve wildlife we have too frequently failed to emphasize the all-important fact that fundamental biological principles apply to wild animals as well as to those of proven greater economic worth. Those biologists with varying interests who have contributed to our accumulating store of knowledge relative to animal physiology have furnished us with facts and principles that apply in general to all animals, both wild and domestic.

It is common knowledge that all animals require food, cover, water, and certain special factors. It is also fairly well known that their needs in these respects differ widely between species; but it is not so generally appreciated that the two sexes and the different age groups in the same species frequently have markedly different needs, and further that these needs change with seasons and according to their varying physiological activities throughout the year. Their requirements in these respects are, in fact, vastly more complex than they are ordinarily assumed to be. As noted above, each environment must contain this great variety of species' requirements for each species it is intended to support.

This generation, far more than any other, is acquainted with and has profited from sound nutritional principles. The terms vitamins, essential minerals, and balanced diets have become household words. We have come to realize that food is not just a matter of quantity, palatability, and calories. We are aware
of the importance of the various vitamins to our general health and well-being; of the necessity for certain mineral elements in our diet if we are to possess sound teeth and sturdy skeletons; of the peculiar and different needs in these respects of adults, growing children, and infants. Our diets provide for these changing seasonal needs and the special demands created by our varying physiological activities and physical exertions.

Those familiar with the animal industries know that many of these same peculiar needs occur in domestic animals and the same forethought and precautions are required in connection with their diets if they are to thrive and reproduce. It is only logical to assume that wild animals—so similar in their fundamental structure and functions to the human animal and to livestock—are equally dependent upon these fundamental biological laws, and no less in need of these food elements so universally required by other forms of animal life.

THE NATURE OF ADAPTATIONS

The word adaptation indicates that certain structures or functions possessed by an animal, or certain modes of behavior exhibited by it, enable it to use to advantage many of the factors that go to make up its environment; in other words, it is adapted to its surroundings. We must remember, however, that highly specialized adaptations definitely limit the range of activities of their possessor. There can be no gain without some sacrifice. Specialization allows for greater freedom along some lines, but at the same time it restricts within narrow limits activities in other lines. Adaptations are just as truly limitations. Second in importance to the requirements of animals are those limitations imposed upon them by their structure and habits.

These restrictions give rise to definite sets of habits which constitute the animal’s behavior pattern. This pattern is an expression of the animal’s abilities and ordinarily it can be modified only slightly. It is in reality the sum of the responses the animal is compelled to make to its environment. As a consequence, our conservation measures must be adapted to fit not only the needs of animals but their abilities as well. They cannot change to suit our convenience. The materials they require must be provided in acceptable size and usable condition in available locations. These points will be determined by the animal’s structure and functions. In addition the location of the various materials in relation to each other, that is, the distribution pattern, must be such that he animal has ready access

*Nineteen Forty-three* 35
to what is needed when it is needed. This point will be determined in part by its structural adaptations, but in still larger part by its behavioristic adaptations.

THE PROPERTIES OF ANIMAL POPULATIONS

Just as particular adaptations are characteristic of the individuals of a species so are here modes of behavior characteristic of aggregations of these individuals. Leopold has called these modes of behavior characteristic of entire species their population properties, and points out that just as in the case of man some of them are not discernible in the individual bird or animal, but become apparent only through a study of the behavior of entire populations.

We undoubtedly know relatively little as yet regarding these properties. There are many awaiting discovery and much more to be learned about those we already recognize, but we know enough to prove their existence and demonstrate their importance. It is not necessary for the public to understand all of the fine points included in this large body of technical knowledge, but a general understanding of the fundamental fact of population properties and their nature would be most helpful. It would aid in making clear that conservation must be primarily concerned with the needs and abilities of the entire species and not with exceptional requirements or modes of behavior as noted by the casual observer.

Many persons honestly interested in conservation have made wildlife observations. Some of these observations were accurate, many of them erroneous. In very few instances were a sufficient number of observations made to justify the drawing of any conclusions. And yet this mass of observations—the accurate and the inaccurate, the complete and the incomplete—has been passed on by word of mouth and frequently preserved as published material. Selected portions of it have been interpreted or, in some instances, misinterpreted, the nature of the interpretation of course depending upon the limited knowledge or special interests of the individual responsible for it. Many of these interpretations are now widely disseminated. A large part of our educational effort must be directed toward remedying this situation. Much of it would be remedied automatically if the public had a clear conception of the broad principles involved and the scope of their application.

TOTAL POPULATIONS

The maximum population of any one kind of animal that can occur on an area, i. e., the species’ saturation point, is not known

Ames Forester
for many species. In those instances where it is known it seems at first thought to be surprisingly low, for example, one bobwhite quail per acre, or one ruffed grouse per four acres. These apparently low species populations are actually maximum populations, and occur only rarely, and on only exceptionally productive areas. The statement that a woodlot has only one grouse on every four acres is accepted as indicative of a sparsely inhabited area, for to the majority of people this seems an almost negligible number of birds, so widely scattered as to offer little prospect of flushing one. Actually, however, grouse populations of this density are extremely high.

Except for purely temporary concentrations on locally favored areas, wild animal populations rarely, or never closely, approach the population levels popularly supposed to exist. It is necessary for those seeking to understand wild animal behavior to adjust their ideas to a relatively new conception of the population levels of individual species.

Unfortunately this is only half of the picture. A second and equally difficult adjustment has to be made with respect to the total number of all the kinds of animals present on any given area. A single environment usually supports several kinds of animal life, and an area on which a number of different kinds of environments occur will ordinarily support a great variety of wild species.

These population concepts add much of interest to our study of wild animals. They are of most importance, however, in connection with our efforts to conserve wildlife. Although we may determine the carrying capacity of an area for one or several species in which we are interested, or although we may know the maximum populations attainable for a number of species we wish to encourage, it does not follow that providing foods and coverts in quantities sufficient to meet the needs of these predetermined numbers will insure these quantities to the species we are attempting to conserve. There are always the several score of other species occurring on the same area and their total populations are far in excess of those of the species we are seeking to encourage. They must eat, find shelter, and provide for their special needs, and these demands on the environment must be met from the stock of materials that provides for the favored species. Any conservation program must take into account these total populations.

Elimination of this lesser fauna is impossible and would be unwise if it were possible. It would be too expensive, it would disrupt important ecological relationships, it would remove

*Nineteen Forty-three*
necessary buffer species, it would destroy links in food-chains on which certain of the more favored species are dependent, and it would remove species of interest to groups of people who are as much entitled to their rights and interests as are any other groups.

THE SENSITIVITY OF POPULATION CURVES

Due to the inherent force of natural increase wildlife populations are constantly striving toward increase and expansion. This expansion is just as constantly opposed by the resistance offered by the environment. The result is usually either a stable or declining population.

By far the greater part of our conservation effort is directed toward increasing wildlife populations. Usually the best means of accomplishing this is through a reduction of environmental resistance. In order that environmental manipulations may be most effective and most economical it is necessary to identify the various factors offering resistance, that is, responsible for the losses, and determine the relative value of each. When the more important factors are known and their separate effects evaluated it is quite frequently the seemingly insignificant or those responsible for relatively small losses that are most amendable to quick and economical control. The tendency is to ignore these apparently minor influences and concentrate on those which obviously account for larger losses.

This tendency would be much more easily corrected if the public realized how even a slight reduction in the mortality rate in the majority of species results in a disproportionately large increase in the survival rate. If, for example, each pair of a species produces twelve young per year and they all survive, each family, which originally included only two individuals, would at the end of the first year consist of fourteen individuals, a 700 percent increase. If the number of individuals remains the same year after year, then there are not more than two members of each family surviving each year. If more than two survived there would be an increase. Under these conditions the twelve members of each family lost each year equal 100 percent of the mortality in each family; then one individual equals approximately eight percent of the total mortality. If the mortality rate could be reduced as much as eight percent, leaving three individuals alive at the end of the year instead of two, there would be a 50 percent increase in survival and a doubled population in two years. It is unlikely that any such results will ever be attained. Even the most ardent conserva-
tionist would probably be satisfied if we could succeed in doubling a population over a period of years. Under the conditions outlined above a one percent reduction in the mortality rate would result in doubling the population in twelve years; a two percent reduction would accomplish the same thing in six years.

INTERRELATIONS AND THE EFFECTS OF LAND USE

No program having to do with the conservation of natural resources can be limited in its application and results to a single resource. All of the organic natural resources are so interrelated that any attempt to control or influence one is bound to affect the others. Failure to recognize this fact has resulted in much unintentional harm in the past and has on occasion seriously retarded conservation work. Organic resources are so intimately associated with surface features that their conservation can be accomplished only through manipulation of these features and such manipulations, inaugurated for the benefit of any particular resource, are bound to affect every other resource dependent to any extent upon the same surface features.

A comprehensive program which makes allowances for these interrelations, utilizes such knowledge as is now available relative to these other resources, and provides a coordinated and correlated scheme of work based on this knowledge, will not only avoid making changes detrimental to wildlife but will very often greatly enhance wildlife conditions at no additional cost in either labor or materials.

Whatever the primary objective of any conservation program, the practices employed may serve many additional purposes. These secondary results may be simply incidental to the primary aim or they may be an integral part of the work, planned and provided for in the program. If they are merely incidental to the work some of the effects will be adverse rather than beneficial, some of the beneficial effects will be only partially realized, and none of them will be coordinated with the others so as to derive the maximum good from the money and effort expended. If they are an integral part of the program, planned and provided for from the beginning, their complete accomplishment can be realized at very slight additional cost in either money or materials and the program will then assuredly result in the greatest good to the greatest number.

We must constantly keep in mind that the demands made upon both the environments and the wildlife the innumerable influ-

Nineteen Forty-three 39
ences brought to bear upon them, and the various uses to which they are subjected condition every effort we make at conservation and every response we obtain.

THE TRIPARTITE NATURE OF THE CONSERVATION PROBLEM

From what has been said relative to the nature of the resource, its various values, and the interrelations involved in its use and conservation, it is apparent that the mechanism we are here considering is not purely biological—it is in large part economic and social. The purely biological problems are important and numerous. They are, however, the primary concern of the wildlife technician and are being attacked on many fronts. The economic and social problems are not less important but unfortunately they have as yet received relatively little attention. Harris states his case as follows: "In grappling with these problems more than science as we conceive it today is required. These are not problems of biology alone—they are problems of the application of the results of biological research under difficult economic and political conditions. It is here that some new type of man must establish his interests on the frontiers of biology and economics."

It is not held that everyone practicing conservation must be economist, social engineer, and biologist. Extensive knowledge of the above-mentioned facts and principles is not essential for one's personal enjoyment of wildlife, but some understanding of these concepts is necessary if one is to derive the most from his conservation efforts and vote intelligently on land use proposals. We cannot escape the fact that wildlife conservation in its broadest sense is dealing with biological-sociological-economic problems.

THE OBJECTIVE OF A CONSERVATION PROGRAM

Finally there must be an understanding of and agreement on the objective to be attained. This is mentioned last, not because it is less important than the other points discussed, but because the preceding discussion should aid in its formulation and expression. It may be stated very briefly, and I cannot do better than paraphrase Leopold in this connection: The objective of a conservation program for wildlife is: to retain for the average citizen the opportunity to see, hear, admire, enjoy, and use, and the challenge to understand, the varied forms of wildlife indigenous to his region. This implies not only that these forms be kept in existence, but that the greatest possible variety of them exist in each community.
A better understanding of the concepts so briefly presented in this paper would not only aid in attaining this objective, that is, retain for the average citizen these several opportunities, but would also better equip this same citizen to make the most of these opportunities.

\[\text{ Courtesy of American Forests}\]
Forestry in the Deep South

By ARTHUR D. READ

FORESTRY has little or no past in the South, not much present, but a wonderful future. In today's program of land planning and correct land use there is no greater need than to have every acre of potential timber land fully productive. Idle acres, or at the best acres producing but a fraction of their capacity, are found in every tree region and in most types in these regions in the United States. But no type is probably so completely denuded, with seventy-five to eighty percent of its area barren of tree growth, as is the longleaf-slash pine type of the Deep South.

Fifty years ago this forest of yellow pine, as this species was then called, was a magnificent, unbroken sweep of millions of acres of timber stretching from East Texas to the Atlantic ocean. These stands were composed of thirty to forty inch trees, one hundred or more feet in height, with stems clean of limbs for three to five logs. The stands ran from 15M. to 25M. feet board measure, Doyle scale. Burned clean of underbrush and reproduction, a horseman could ride through this forest anywhere. Growing on level, sandy soil, free from rocks, "the flat woods" was a loggers' paradise. And were not the lumbermen proud of their timber? Thirty to forty years ago the American Lumberman had page after page of pictures of this beautiful pine forest, as each lumber company advertised its wares—The Kaul Lumber Company, Pickering, The Southern, Long-Bell and many others in those golden days of the South.

History as shown in Maine, Pennsylvania, and the Lake States repeated itself here. The real attack on this martial array of Pinus palustris began about the turn of the century. The white pine forests of the Lake States were nearly finished. Mill men from the North began coming south hunting new loca-

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Nineteen Forty-three
tions. New railroads, The Kansas City Southern for one, were built into this virgin freight country and old lines ran branches into it. Soon many large mills were operating, often with two to three saws. The steam nigger was invented. Steam skidders, usually with two lines but sometimes with four—two fore and two aft—reached out for one quarter of a mile on each side of the logging tram and for ten to twelve hours per day dragged logs, crashing and slipping, through the slash to the long lines of waiting log cars.

The timber seemed to be inexhaustible. Besides, to many operators, cutting out was nothing new. They had done it in the Lake States. When the yellow pine gave out, there were the untapped Rockies, the sugar pine and redwood of California, the vast forests of “Oregon Pine” (Douglas fir) in the Northwest. The first World War from 1914 to 1928 although not a knockout blow to Yellow Pine, was the winning round. A terrific demand—no ceiling—no labor shortages—no wage and hour laws—no priorities in machinery—no tires to conserve: every saw in the big mills whining and growling for twenty-four hours in the day, seven days in the week. The timber vanished like the proverbial snowball. In 1922 or thereabouts the end could be seen. Mills began cutting out. Head timber cruisers caught trains for the West. By 1930 practically all of the longleaf pine (as was its common name by this time) was gone with no chance of reproduction. The heavy demand ten years before had taken every tree that would make a two by four. Skidder logging uprooted and broke down all the rest. Not a single seed tree was left on many large areas and on the balance too few to be effective. Reproduction of longleaf is difficult because of several factors. More seed trees per acre are needed than of the other species of pine because the seed is larger and heavier. It is not carried so far by the wind and there is such a small number of seeds per pound—4500—compared to the seed of loblolly and shortleaf. Longleaf not only has fewer seeds per pound but also the years of good—normal or heavy—seed crops are few—5 to 7 years apart. Also the seed falling in October and November is eaten avidly by birds, rodents, sheep (of which there are quite a few in some localities) and hogs. Although longleaf is more fire resistant than most conifers, the recurring fires take their toll of fallen seed and one and two-year-old seedlings which in rare instances have managed to establish themselves. The species is susceptible to damage and death by hogs from seedling stage.

Ames Forester
Fig. 1. Grading Longleaf seedlings at Stuart Nursery.

Fig. 2. Planting Longleaf seed at Stuart Nursery.
until ten or fifteen years old. During the winter when other feed is scarce hogs eat the thick, succulent bark of the long-leaf roots with great relish. Much reproduction is killed from this cause for there are large numbers of range (unpenned) hogs all over this region.

So from all of these causes—heavy logging and difficulty of reproduction, where once sotod some of the finest timber in the world now appeared man-made prairies as slick and clean —barring the stumps—as those of western Kansas, but, alas, growing grasses worthless for livestock. The government experiment stations can tell you exactly how many acres there are of such barren land but suffice it to say the amount runs into several million.

AFTER the hectic days and false prosperity of the early twenties there came a great calm. Here and there a head would cautiously stick out from behind a stump, look around and begin to consider what could be done about salvaging the wreck. A few foresters, Austin Cary, P. N. Howell of Mississippi, J. K. Johnson and Ben Smith of Louisiana, Jim Fowler of Georgia, Hall of Arkansas, began crying in the wilderness the unheard of idea that woods fires should be stopped and possibly some trees planted. “Reforestation” was added to the lumberman’s vocabulary. A few companies established nurseries with an output sufficient to plant twenty-five to a hundred acres or so annually. The Southern Forestry Congress held a rousing meeting in New Orleans in 1927. The American Forestry Association put on a campaign against forest fires complete with sound truck, service, and lectures, which roamed up and down the South for three years. Three ten-acre plots of slash pine (Pinus caribaea) were planted in 1926—two by lumber companies in Louisiana and one in Texas by the recently created Texas Forest Service. These plantings were with the idea of testing the adaptability of this valuable pine to the region west of the River. Slash pine is an excellent, fast growing, gum producing species indigenous to the longleaf type east of the Mississippi River but which, for some unknown cause, had never established itself west of that river. Sargent considered it the “most beautiful of all southern pines.” The Southern Forest Experiment Station was organized with R. D. Forbes as director. The Kisatchie National Forest was started in 1927 by the purchase of a few hundred acres of stump land. State forestry services were being created in all of the southern states.
This sort of forestry and reforestation went on for several years. Little real, or at least noticeable, good was accomplished but an excellent foundation was being laid. The fire protection idea grew. The foresters hoped that the educational talks made to the school children and the fire-warning book marks distributed to them would have a good effect in later years. A few lumber companies increased their nurseries and planting to what was considered, in 1930, a large scale. In this period—1925 to 1933—nursery practice and technique was initiated, overhauled, and perfected to fit southern conditions. A few professional foresters were hired by lumber companies. Also, some in the employ of the new state forestry services were acquiring training in southern conditions and methods.

All of this, however, made no progress towards putting trees on the millions of acres of cutover land. The stumpland prairies remained unchanged. All of this—both good and bad—is the past of forestry in this region, but there is no use crying over spilled milk.

The spring of 1933, with the advent of the Civilian Conservation Corps, ushered in the present of forestry. Looking back over the past ten years much advancement in forestry can be noted. Fire protection is better planned, organized and equipped. Controlled burning, which is burning the woods in blocks or units at a time when the combination of wind and humidity is such that damage to the stand is precluded, has been a controversial subject among southern foresters. The value of it, however, is becoming accepted as good management and will be used more and more in the future for fire protection. The thousands of boys who spent one to two years in the C.C.C. organization surely have carried home with them many principles of forestry and the knowledge of the value of timber to the South. The number of foresters employed by the lumber industry has increased several hundred percent. Government and state foresters employed by various bureaus and under several different laws also show a large increase.

In the lumber industry what little remains of the yellow or longleaf pine is now merged with slash, loblolly and shortleaf pines under the trade name of “Southern Pine.” The value and possibilities of the second growth of these species is now recognized. Seldom are any timber owners found who consider a stand of reproduction—no matter what size or age—as worthless brush, for too many farmers are now selling sawlogs for $6.00 to $10.00 per M. board meet cut on land which they them-

Nineteen Forty-three
selves can remember grew cotton forty or fifty years ago. Last but not least a small step has been taken towards the actual reforestation of these deserts of the Southeast. By 1933 there were in the neighborhood of seven to ten government and private nurseries in the longleaf type with a total annual production of about 10,000,000 seedlings. All was hand work except for the plowing of the nursery seedbeds by a team of mules.

In the fall of 1933 the Robert Y. Stuart nursery was established by the U. S. Forest Service on the Kisatchie National Forest near Pollock, Louisiana. The dedication of this nursery, at which E. A. Sherman, an Iowa State Forestry graduate, was the principal speaker, was a mile post in southern forestry; both because of the size of the nursery—an output of 25,000,000 seedlings annually—and the replacement of nearly all hand labor by machinery. On the Stuart plowing and harrowing is done by tractors. There are tractor pulled bed-plows to shape and “hill up” the seedbeds. The pine seed is drilled in by machines instead of being broadcast by hand. Seedlings are lifted by means of a blade hitched directly to a tractor instead of being dug with spades. Many nurseries with a light sandy soil are using mechanical weeders with great success although at the Stuart this work is still being done by hand because of the heavy clay soil found there. Twenty-five and fifty-foot seedbeds went into the discard. The beds are now as long as the compartments—two to four hundred feet.

The first modern seed extracting plant in the South, if not in the United States, was built at the Stuart Nursery. Instead of the old type using a furnace on the ground floor with hot air pipes opening into the seed room, a modern commercial dryer has been installed, steam heated by an electrically controlled oil burning boiler. Electrically operated cone shaker, dewater and cleaner complete the extractory which can handle 500 to 600 bushels of cones producing 400 or 500 pounds of clean longleaf seed in a twenty-four hour run. Longleaf is the only seed handled during the last few years at the Stuart.

In connection with the extractory are six curing sheds in which the green cones, collected in October, are spread out for forty to sixty days to lose their excess moisture. The banner year for the extractory was 1939 when 33,000 pounds of longleaf seed was extracted from 41,000 bushels of cones. Sixteen thousand pounds of longleaf seed and one thousand pounds of slash pine seed are the annual requirements of the Stuart,
sowing at the usual ratio to produce 75 percent longleaf seedling and 25 percent slash.

A cold room, with a capacity of 35,000 pounds of seed, where the seed is stored in G. I. cans and kept at a temperature of 33 to 38 degrees, is also a part of the extractory system.

The Stuart was the beginning of a flood of similar nurseries. Another Forest Service Nursery, The Ashe, was started in Mississippi. With C.C.C. labor available the states began to increase the size of their nurseries. Every longleaf state now has a nursery with a capacity of 10,000,000 to 20,000,000 seedlings. The Soil Conservation Service also has four or five large nurseries scattered throughout this region. Altogether there is, easily, a total annual output of 175,000,000 to 200,000,000 seedlings. Machinery which lessens the cost of growing the seedlings is being continually devised and improved. Bed plows are better. A Seaman rototiller, fifty-six inches wide, has many advocates among southern nurserymen as well as elsewhere. A system devised at the Ashe nursery of grading and root pruning on endless belts under shelter is being successfully used at several nurseries. The practice of fall sowing longleaf in the seedbeds is becoming increasingly more popular.

In the ten years covered by this accelerated planting program approximately 500,000 acres of barren stump land in the longleaf type has been reforested. This is a large acreage but it hardly makes a dent in the entire area in need of planting. For the most part the plantations consist of either five to twenty-five acre tracts on farms or larger plantations on Federally owned land. The thousands and thousands of acres owned by lumber companies are practically untouched.

This is the present condition of forestry in the South. What does the future hold? The longleaf type is potentially timber land. It is true that a small percentage of this type can be profitably devoted to livestock or farm crops—tung oil for instance—but by and large it is definitely submarginal farm land best adapted to raising timber and in our national economy should be devoted to such use.

World War I reduced our virgin stock of timber in the South to almost zero. World War II is proving a serious drain upon our reservoir of second growth, the value and character of which has just become recognized. So much timber will be needed before it is possible to grow it. Pulp for paper of all kinds and for cellulose, lumber for housing, ties, boxing, furniture. Supplies for all these demands will be zero, except pos-

*Nineteen Forty-three*
ibly ties, and will have to be accumulated as rapidly as possible.

With a scanty supply of timber after the war and an increasing demand which cannot be filled many substitutes will undoubtedly be found and the annual lumber consumption will possibly drop year after year. This condition, over a long period, together with an increasing demand for more planting, will cause careless thinkers to question the practicability of an extensive reforestation program. They will view with alarm the increasing substitutes and the decrease of lumber consumption and will cry, "Overproduction. Beware of overproduction." But this apprehension is needless. Substitutes are seldom satisfactory or permanent. Nothing can satisfactorily take the place of wood. It is a basic natural source and the need for it will always be great.

It is quite evident that after the war there will be a demand both for lumber and for work. Reforestation is an excellent means to satisfy both needs. Of all the tree regions in the United States the Deep South is probably the best for profitable timber growing. The long growing season, from February to December, is favorable both to the seedlings in the seedbed and to the plantations. In southern nursery practice there are no transplants nor 2-0 stock with their attendant labor. Seedlings which are grown in the nursery but one season are plenty large for planting. Planting is done during the mild winters, in December and January, which gives the plants ample time to get well set before the arrival of the drier spring. Abundant rainfall well scattered throughout all the seasons make the pines grow unbelievably fast. Fire danger is lessening. There is a growing concern among the citizens against fire. Controlled burning is also gaining favor in the longleaf type.

How can these millions of acres of stumpland owned by lumbermen, oil companies, landholding companies and others, in tracts of one hundred to thousands of acres, be planted, protected and managed? Many owners possibly do not care to plant—do not have the money available for such a long-time investment. Taxes are often an obstacle. Owners hesitate because of possible loss from fire or theft. Indifference. Some owners have made their stake and are content now to hold the land with the hope that oil may be found on it. (This is particularly true in Texas and Louisiana.) They may be content to hold it for some future unknown demand.

The timber which this land could and should produce is go-
ing to be needed more and more in the future. This presents a national problem, the answer to which is: planting, protectino and management by the Federal government. This is possible, the timber remaining in the care of the government until it reaches a certain age or size and then turned back to the owners with the cost of this work as a lien against the timber—a self liquidating project.

To do this job will require money—millions of dollars—and legislation, but neither is out of reason nor impossible. The idea—reforestation to make work—is nothing new. About 1930 or ’31 Raphael Zon proposed reforestation (nursery and planting) on a large scale as a relief measure. “It will take years to grow the seedlings in the nursery.” “Where is the money coming from?” Millions of dollars for such class of work except for dams to reclaim desert land was unheard of at that time. “The depression would be over in six months.” But the depression lasted for years. Millions of dollars were found for relief. Zon’s ideas were finally accepted and used on a nation-wide scale on government owned land with great success. So it can be seen that the idea of reforesting the longleaf type is not visionary. Is there much difference between redeveloping our timber lands in this manner and in developing our arid lands by means of large and costly dams the costs of which are eventually liquidated by the owners. How much better is such work than the “relief” work recently finished—unnecessary and temporary road work, roadside beautification, sanitary privies and other boondoggling with no return but “relief” for the money spent.

To do this work huge and intricate plans must be made. It is not the purpose to even approximate a complete plan in this article but a few of the outstanding matters which must be settled are: the length of the program—10 or 20 years? Shall the plan be drawn for the entire region under discussion or shall the region be divided by states or units and the plan made effective on those units where the owners of a majority of the acreage wish it? What about loss of revenue to the states from present taxes? What interest, if any, shall be charged against the investment? What sort of nurseries—size, equipment—shall be built? To supply how large a planting unit? What species to plant—longleaf or slash or both? These and many other questions and policies will have to be decided.

Not only will the physical plan have to be threshed out and constructed but legislation also will be necessary whereby the
plan can be legalized, financed and liquidated, for at present the
government cannot plant privately owned land.

When finally put into operation, consider what such a pro-
gram would mean. Millions of acres which have been pro-
ducing nothing for the past fifteen to twenty-five years would
in another ten to twenty years have a good start—in some cases
will have reached that point—towards producing millions of
cords of pulp, millions of poles, lumber and all sorts of wood
products. Also think of the constructive, worthwhile work
provided for thousands of men; some yearlong work and some
part time work, in the nurseries, planting, protection, mapping,
cruising and general management work. Twenty or thirty years
after this preliminary effort will come the harvest—another
demand for labor. No more “cut outs.” A steady return of
products and labor throughout the years.

Such a project will no doubt be opposed by many of the
owners but it should not be for it is neither government regu-
lation nor infringement upon state rights. It is the government
financing work which neither the individual nor the state is
able or can be expected to do. As proposed the program would
apply only to the longleaf type; a type 80 percent cutover, not
regenerating and incapable of natural regeneration. In other
words, natural timber land which is best adapted to growing
timber but which will remain unproductive unless and until
planted.

The only real obstacle to this project is public apathy or strong
opposition by some owners through ignorance or for selfish
reasons. The job can be done.
The Effects of Site Preparation on Survival and Growth of Selected Hardwood Species on Eroded Soil

By J. M. AIKMAN
Iowa Agricultural Experiment Station and U. S. Soil Conservation Service, Research

OBSERVATIONAL studies of numerous plantings of hardwood species for shelterbelts, woodlots, erosion control and in reforestation and afforestation projects have shown that, unless soil and climatic conditions are extremely favorable, planting without some attempt at site preparation is often disappointing. This is especially true if the soil conditions have been rendered extremely unfavorable by excessive sheet and gully erosion. Such a condition prevails in the erosion problem area of southern Iowa on sites usually selected for erosion control tree planting. In this and comparable areas, numerous examples can be found of plantings in gullies and on badly eroded slopes which show, after several years, a low rate of survival, poor establishment of many which did survive and inadequate growth of the occasional seemingly favored tree.

The experiments, the results of which are reported in this paper, were conducted at the experimental field station of the Iowa Cooperative Hillculture Project located near Floris in Davis County. No attempt was made to test any considerable number of site preparation treatments although this has been done at the same station using plums and grapes for fruit production.

In the 1939 experiment to test the effect of site preparation on establishment and early growth of hardwood species, planting on contour furrows was compared to scalp planting in contour rows without furrows. A single furrow approximately 10 inches deep was plowed with an 18-inch tractor-drawn plow, the soil being thrown downhill. The best location for trees on a single contour furrow seems to be next to the open furrow on the edge of the ridge formed by the loose soil. Much less hand labor is involved in planting in this location than in making scalps and planting in hard, unplowed soil.

In order to correct for variations in minor topographic differences and soil heterogeneity, the experiment was set up so that
each of five contour planting rows, extending around the hill at right angles to the slope, was made up of six sections, one-half chain in length, alternating the furrowed and unfurrowed condition three times. The average distance between the furrows was 20 feet. The degree of slope was approximately 20 percent. Since the contour plowing was made in early April, only about three weeks before planting, and no large rains occurred after plowing and before planting time, any evident differences in plant response between the two site preparations the first season may be attributed to the modified soil structure and any increase in moisture during the season. Other furrows made the preceding fall showed a proportionately higher water content because the furrows helped conserve the fall and winter precipitation.

Four species of deciduous woody plants, covering as wide a range as possible of habit and requirements of growth, were used in the experiment: linden, Concord grape, black locust and seedling peach. The plants were set out in units of five, one of each plant in randomized order, at a spacing of 6.6 feet, each unit covering the half chain distance in the row. There were approximately 30 plants of each of the species in the five rows: 15 of each on the furrowed and 15 on the unfurrowed portions of the row. Cultivation was with a hoe and was comparable in the two treatments, care being taken to prevent competition from weeds.

The response of the plants, at the end of the first season, to the furrowed and unfurrowed conditions of the experiment is shown in table 1. There was no consistent difference in percentage survival in the two treatments. Although the soil on the slope of the plowed ridge was less compact than in the scalped spots, planting in both sites was with a tile spade and the disturbance of the soil in the scalped spots by the planting operations, together with a slight advantage in the spots because of the shallow top soil remaining in place, probably accounted for approximately as favorable establishment response in the spots as on the edge of the furrow. There was also no moisture advantage in the furrows at planting time.

The plants on the furrows had an advantage, of considerable magnitude in most instances, in growth response as indicated by an increased number of new branches, an increase in average total length of branches and in average height growth. The advantage in growth was most apparent in the difference in average total length of new branches which is a definite indication of increased food reserve and resulting plant vigor.
TABLE 1
Survival and growth response of four plants to furrowed and unfurrowed, scalped conditions on eroded Lindley loam with approximately two inches of top soil. 1939.

<table>
<thead>
<tr>
<th>Species</th>
<th>Treatment</th>
<th>No. Plants</th>
<th>Branches per Cent</th>
<th>Ave. No. New Survival Per Plant</th>
<th>Ave. Total New Branches Inches</th>
<th>Ave. Height Growth per Plant Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linden</td>
<td>Furrowed</td>
<td>17</td>
<td>52.4</td>
<td>1.4</td>
<td>2.7</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>Unfurrowed</td>
<td>14</td>
<td>57.1</td>
<td>.8</td>
<td>1.4</td>
<td>8.4</td>
</tr>
<tr>
<td>Concord grape</td>
<td>Furrowed</td>
<td>16</td>
<td>82.3</td>
<td>2.4</td>
<td>26.1</td>
<td>11.9</td>
</tr>
<tr>
<td></td>
<td>Unfurrowed</td>
<td>19</td>
<td>73.7</td>
<td>1.3</td>
<td>7.2</td>
<td>6.1</td>
</tr>
<tr>
<td>Black locust</td>
<td>Furrowed</td>
<td>18</td>
<td>22.2</td>
<td>1.7</td>
<td>14.4</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td>Unfurrowed</td>
<td>14</td>
<td>28.6</td>
<td>1.1</td>
<td>7.8</td>
<td>11.6</td>
</tr>
<tr>
<td>Seedling peach</td>
<td>Furrowed</td>
<td>16</td>
<td>25.0</td>
<td>3.0</td>
<td>25.7</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td>Unfurrowed</td>
<td>17</td>
<td>23.5</td>
<td>2.1</td>
<td>19.5</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Experiments initiated in 1940 on the effect of site preparation on survival and growth of selected hardwood species were designed to make improvements in the prepared sites without excessive expense or effort. Plantings of several species of hardwoods were made on the B horizon of eroded Lindley loam in scalps of one square foot with no other site preparation. Comparable planting stock of the species was planted on plowed 5-foot contour strips on the same soil. In one experiment, 1-0 white ash, bur oak and black locust were used. The plants were carefully selected in order to have the planting stock of each species, planted under contrasting site preparation conditions, as nearly equal as possible in size and vigor. Planting was done with a planting bar in as near the same manner as possible; an attempt being made to keep all plant growth conditions except site preparation identical.

The scalping was done with sharp long handle shovels without disturbing the structure of the soil and without forming a depression for the holding of water. Weed control in the two treatments was as nearly comparable as possible. In preparing the plowed strips four furrows were plowed on the contour, either downhill or uphill, with a tractor-drawn 16-inch plow. The furrow on the down-hill side was approximately 12 inches deep with the other furrows plowed successively more shallow to a limit of 4 inches in depth on the uphill side of the plowed contour strip. The plowed strip was worked down with a horse-drawn 5-foot disc and a harrow. In subsequent experiments the plowing was done with horses with comparable results.
The number of plants used was 50 for each of the two treatments of the white ash and bur oak and 80 for each treatment of the black locust. Rate of survival as determined by stand counts at the end of the third growing season was definitely in favor of planting on the plowed contour strip. Percentage survival of 1-0 stock planted on plowed contour strips as compared to matched stock planted in one-foot scalps was 94 and 40 for white ash, 64 and 28 for bur oak, and 95 and 84 for black locust.

Average growth results, for the three year period following planting, for the three hardwood species planted under the two conditions of site preparation are shown in table 2. The growth increment, by three different measurements, for each of the three species was much greater in those trees planted on the plowed contour strip. While there was the usual degree of variation in growth among the trees within the site preparation treatments, due to immediate site and individual plant differences, it was very low compared to the variation between the two treatments for all three species.

The greatest growth increment differences of the three species in all three measurements between the two treatments were evident in the white ash. Planting under the improved site preparation treatment of the experiment evidently increased the rate of growth, measured by height increment, total branch growth or basal diameter of the stem, approximately ten times. The bur oak ranked next in increase in growth, approximately 5 times by all measurements. The black locust showed the least

### Table 2

Growth response data of three species of eastern hardwoods planted in scalps of one square foot as compared to planting on plowed 5-foot contour strips on eroded Lindley loam. Average measurements at planting as 1-0 stock in 1940 and at the end of the third growing season, 1942, are given.

<table>
<thead>
<tr>
<th>Growth Measurements</th>
<th>White Ash</th>
<th>Burr Oak</th>
<th>Black Locust</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scalped</td>
<td>Contour Strip</td>
<td>Scalped</td>
</tr>
<tr>
<td>'40 '42</td>
<td>'40 '42</td>
<td>'40 '42</td>
<td>'40 '42</td>
</tr>
<tr>
<td>Average Height, feet</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Ave. total branch growth, feet</td>
<td>0 2.8</td>
<td>0 28.8</td>
<td>0 2.4</td>
</tr>
<tr>
<td>Ave. basal diameter, inches</td>
<td>.38 .47</td>
<td>.38 .1 .4</td>
<td>.30 .37</td>
</tr>
</tbody>
</table>
increase, approximately 2 times. Although an insufficient num-
ber of measurements were taken to obtain average total branch
growth values for the black locust, the picture of the two aver-
age black locust trees in figure 1 indicates that the difference
in total branch growth was approximately the same as the
difference in basal diameter growth in this species, 2.7 times.

In the evaluation of rate of growth under different treatments
in experiments of this sort, it has been found that for all species
total length of new branch growth seems to be the most depend-
able criterion of rate of growth. However, it will be noted with
these species, as with most others studied, that there is a defi-
nite relationship between total branch growth and basal diamet-
er growth although, as would be expected, there is a slight lag
in growth in basal diameter as compared total branch growth.

Although the growth response to the modifications in site
preparation of the 1940 experiments was least in the black
locust, an examination of the growth curves of this species for
a three year period (table 3, indicates that even in this species
the rate of growth difference between the two treatments was
greater from year to year. In most other hardwood species,
this divergence was greater than in the black locust. Other
site preparation experiments with black locust showed that
greater rate of growth differences were evident where very
unfavorable site conditions were corrected by site improvement
since black locust grows quite well under moderately favor-
able conditions without special site preparation but shows
marked response to any site preparation which improves the
plant growth conditions of unfavorable sites.

The modification in rate of growth seemingly induced by site
preparation in the 1940 experiments are shown in figure 1.
Trees of each of the three species were selected from each of
the two treatments which gave measurements equal, as nearly
as possible, to the average of all trees of each species grown
under prepared and unprepared site conditions.

The results of the 1940 experiments presented in the tables
and the figures are preponderately in favor of contour strip
planting as compared to scalp planting. From these exper-
iments, in which soil moisture data to the depth of root penetra-
tion were collected, and from other experiments, designed to
evaluate the relative effects of improved soil moisture condi-
tions and improved soil aeration conditions of the plowed strip
as compared to planting scalps, the conclusion has been reached
that the improvement in plant growth conditions for most hard-
woods seems to be attributable, about equally, to these two

Nineteen Forty-three
factors. However, there is evidence that in the black locust, planted on the B horizon of Lindley loam, improved soil aeration, induced by the modified soil structure as a result of plowing, seems to overshadow the factor of increased soil moisture.

### TABLE 3

Average measurements of the black locust of table 2 showing growth by years from planting of 1-0 stock in April 1940. The scalps were one foot in size and the plowed contour strips were benchlike and five feet wide.

<table>
<thead>
<tr>
<th>Measurements and Treatments</th>
<th>Stock Size</th>
<th>1940</th>
<th>1941</th>
<th>1942</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average height, feet</td>
<td>Contour strip</td>
<td>.9</td>
<td>3.8</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td>Scalped</td>
<td>.9</td>
<td>1.7</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Difference in increment</td>
<td>2.1</td>
<td>3.7</td>
<td>5.4</td>
</tr>
<tr>
<td>Average diameter, inches</td>
<td>Contour strip</td>
<td>.28</td>
<td>.59</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Scalped</td>
<td>.27</td>
<td>.35</td>
<td>.43</td>
</tr>
<tr>
<td></td>
<td>Difference in increment</td>
<td>.23</td>
<td>.66</td>
<td>.97</td>
</tr>
</tbody>
</table>

Based on the data presented in this paper, it would seem advisable in establishing plantings of hardwoods to practice site preparation to the extent of some form of plowed contour strip comparable to the one described here. This practice would seem especially desirable since the planting on plowed contour strips requires less hand labor and can be done by the farmer with the use of his team and ordinary farm equipment with no added expense and little extra time.

Figure 1. Selected trees showing at the end of three years, average growth response of the three tree species planted on the plowed contour strips (A) and in scalps (B). In order from left to right are white ash, bur oak and black locust. The scale is graduated in one-foot units above and below the ground level.
Mearn's Cottontail Investigations
In Iowa

By GEORGE O. HENDRICKSON

THE importance of the cottontail as a game mammal has increased rapidly in recent years. From records and estimates supplied by State game agencies the United States Fish and Wildlife Service estimated that 20,000,000 rabbits were taken in the United States in 1941 for food and for sport, a recreational outlet for several million citizens now (Crouch, 1942).

For some years shortened seasons and decreased bag limits partially satisfied increased numbers of cottontail hunters in northeastern states. To increase the seedstock about 25 years ago, those states began to purchase wild cottontails in central states where hunting pressure was considerably less than in the east. Also, the need for improvement of cover became apparent. As the rabbit importing business developed the prices rose, with decreasing supplies and increasing demands, too high for eastern buyers. Finally sportsmen of central states asked for legislation to curtail excessive shipping of the game out of their states in years of low populations.

The eastern states tried cottontail farms from which seedstock was liberated in the wild, but the production cost was too high to be met willingly by the average hunter. About five years ago Pennsylvania began to trap rabbits in villages, cities and preserves where shooting was inadvisable and release the animals in the hunting areas at one-third to one-half the cost of western rabbits (Gerstell, 1939). Ohio devised a similar sys-


Nineteen Forty-three

59
tem (Stuber, 1938). The policy of improvement of the cover and the maintenance of a sufficient seedstock in the wild was accepted by Iowa in its Twenty-Five Year Conservation Plan (Leopold, 1933), before our rabbit resource was depleted badly. All that remained was to devise economical and practical methods of inventory and cover improvement through research which was also envisioned in the Plan and shortly started.

**Experiments With Penned Cottontails**

Now a wildlife manager is concerned chiefly with animals in the wild. Consequently he values very highly information gained in the field. The research worker who devises field practices in game management often finds that field information is interpreted better with knowledge gained from penned animals. Such knowledge is not always gained easily as many have learned who have caged cottontails (*Sylvilagus*) for observation (Dice, 1929).

After learning in a game management course with us in the fall quarter, 1936, how little was known about the breeding habits of cottontails, Sam R. Blackman and Wilbur A. Wulff, For. '38, volunteered to assist in observation on penned Mearns cottontails (*Sylvilagus floridanus mearnsii*). Shortly after beginning, we accepted the help of Henry Schwane, For. '40, and William C. Landgren, Agron. '38. An open courtyard, about 50 by 70 feet and enclosed by a dormitory in which the students roomed, was taken over for cottontails. Through several windows facing the court the observers, frequently more than we self-assigned, made their observations.

With box traps, three male and three female cottontails were obtained on the campus and placed in the pen between February 6 and February 27, 1937. To provide individual daytime shelters, several boxes and nail kegs were distributed along the edges of the pens but the cottontails did not use them. Instead they took shelter between a ridge of ice, accumulated frozen snow-water from the roof, and the building wall at the south side of the enclosure. There, spread about eight feet apart, they spent the daylight hours of the first few weeks. Although each rabbit was marked with paint or an area of clipped hair, conditions did not permit of learning whether or not any had a fixed site as a regularly occupied form behind the ice ridge.

The court had a few decorative shrubs, chiefly tartarian honeysuckle, common barberry and bridal wreath, and several low black willow, American elm, mulberry and white oak trees.

*Ames Forester*
At first a heavy blanket of snow on the earthen floor aided in night observations. A supply of oats, corn, and wheat was kept in a pan at the north end of the enclosure. Poplar, willow, and honeysuckle twigs were supplied daily. Occasionally alfalfa hay was fed. At first the grain was not taken readily, and honeysuckle was preferred to poplar and willow, the third in choice. Alfalfa was not taken freely and apparently not by all of the animals.

During most of the night hours a rabbit or two could be seen at the grain pan. Never were more than two cottontails seen to eat at the pan at the same time. Only does ate together. When a buck or a third doe approached, one of the feeding does rushed at the intruder, chased it away, and came back to drive the other doe from the pan as frequently as to come back to eat with her. After a month of confinement the rabbits were seen to feed frequently early in the morning and late in the afternoon. To a limited extent the rabbits fed on the shrubbery of the enclosure. They were observed several times to stand erect on the hind feet, deliberately pull branches down with the fore feet and gnaw off twigs. Green grass was eaten when it was obtainable in spring.

Early in the period the fights began. Invariably the participants with tails and ears erect approached each other slowly and cautiously. Then a sudden dash by one or both brought them together. In that dash the rabbits often jumped two feet in the air and the one above brought his claws into play on the back of the one underneath. The fights were short, and the winner did not pursue the loser, which hurried away. No serious injuries and no spilled blood were noted, and only occasional loose hair marked the site of the conflict.

On February 17 the chasing and fighting increased noticeably and continued two days. All the rabbits were seen occasionally in tandem chasing around the court, and at times one spurted, jumped over the one ahead and kicked it out of line as he or she passed over. Schwane observed a pair presumably in copulation in the evening of February 19. Throughout the next day the buck assumed to be triumphant remained near the doe despite obvious attempts of the other males to drive him away. About three weeks later a low tunnel-like shelter of bricks and boards was made at the west side of the court and was occasionally entered by rabbits.

Anticipation of a brood of young prompted close watching for nest building by the pregnant doe beginning about March 12. For although Dice (1929) gave 28 days or possibly less as Nineteen Forty-three

61
the approximate gestation period some have suggested a period as short as 21 days and many as long as 30 days. No attempts at digging in the frozen earth or other activities indicating nest preparation by the doe were noted. The top boards of the artificial tunnel were lifted each two or three days, although none of us expected to find a nest there. But early in the forenoon of March 18 a nest of hair inclosing five blind, nearly hairless young cottontails was found in the tunnel. Probably they were born late on March 17 following a gestation period of 26-27 days. Apparently this nest was not entirely satisfactory for on several occasions the young were found outside the nest on the frozen earthen floor of the tunnel. We looked at and handled the juveniles, perhaps too much, and tried to notice when the eyes opened. The eyes of the young were opened fully on March 27, at 10 days of age, but the lids appeared to several of us to be slightly open two or three days before that. Shortly thereafter, because of events described in the next paragraph, the nestlings were removed to be reared indoors. In addition to taking milk from an eye-dropper they began eating small quantities of green grass at 19 days of age. By April 6 the rearing attempt had failed, all were dead.

Renewed chasing and fighting during the last three days of February, a similar but somewhat less evident pairing of one buck and a doe at the end of the period than with the former pair, and subsequent lessening of fighting suggested a successful mating. On March 31 a second brood of four young was noted in the nest of the first brood with little or no hair having been added. The gestation period then was about 30 days and the two cases averaged about 28 days. After two days it was clear that the nest was not suited to the two broods and the younger ones were found the more often outside in the cold. Then the older ones were taken away from the nest as mentioned above. Only one of the second brood survived, however, for the others shortly after their eyes opened were killed, presumably by an adult cottontail. The rear quarters of their bodies were badly chewed but none of the flesh had been taken.

As all of us were intently concerned with the two litters none observed the adults sufficiently to note mating behavior on the part of a third pair. On April 30 the third female was seen carrying mouthfuls of grass and paper. An observer on following her found a nest excavation at the base of a barberry shrub. On May 2 the hole was filled with grass, tree leaves, and paper, but was without hair. On May 4 the doe was seen to pull hair in large mouthfuls from her abdomen and sides.
Each mouthful was placed in the nest cavity with the assistance of the fore feet so that the hair was innermost of the lining. After all this activity the birth of the young and their deposition in the completed nest was expected hourly, but several days went by and the nest remained empty.

In the meantime the bucks were removed from the court and set free. About one week later, May 12, in daylight the two does which had borne the first broods were noted hopping in file around the enclosure, and several times when the leader stopped the rear one mounted it. They remained within two feet of each other for some hours. During the next three days the three does were removed and set free.

It was evident that the third female had borne a brood, but we were unable to find the nest. Several days after the release of the does Landgren spotted a young cottontail with eyes open, but barely able to move about, in the court. Soon the nest was found with five additional young. Because only one rabbit of the first two litters survived, we decided to leave the third brood in the court to care for themselves. Each evening they were observed to leave the nest and feed on grass. One disappeared but the remaining five continued to spend the daylight hours in the nest for about a week after we found them, after which they were not in it again.

When these five were about six weeks old their ears, and those of the lone survivor of the second brood, were notched. The six were liberated among the honeysuckles adjacent to a heating tunnel nearby on the Campus.

With the resumption of the study in 1938 two male and two female cottontails were caught in January and placed in the dormitory court. All were taken among the honeysuckles adjacent to the heating tunnel previously mentioned. The two males, ear-notched, were of the six cottontails reared in 1937, and released within 10 yards of the trapping site. The males acted as wild as the females which were reared in the open. Continued trapping in the tunnel vicinity yielded two more unmarked rabbits, a male and female, and from track observations it was judged that the six were the population using this shrubby cover of 20 square rods at the east side of the heating tunnel during January. Because our rearing attempts had not been highly successful the previous year we decided to have only two pairs under observation, assuming that there would be less fighting and rearing interference.

Food, the same as in 1937, was provided and accepted as in the previous year. The willow suckers and twigs were taken

*Nineteen Forty-three*
freely, and more of the bridalwreath and barberry was eaten than in the previous year. Grass, when it came on, was again taken freely.

On very cold nights the animals were less active than on warmer nights. On cold nights after hopping short distances the cottontails stopped, fluffed out the pelage and remained quiet for long periods. In daylight the inactive rabbits were approached more closely in damp weather than in dry weather.

Each animal had a form at which it could be found regularly for some days, and from which a well-defined path of exit was used as regularly. For instance, one doe flushed from her home form near the southeast corner of the court moved north along the east wall, rested a while under shrubbery at the north end and, when not disturbed further, returned shortly along the west and south walls to her regular form. Chased from its regular form, a resting rabbit when approached appeared to flatten closer to the ground than at the home site. Noises only at close range frightened the animals from their forms.

Possibly because the ice ridge was lacking in 1938 the cottontails sought the shelter of the artificial tunnel and boxes in coldest weather. But as in the previous winter in warm periods the four occupants of the court tended to have regular forms in the open at the south end, possibly because the entrance door of the court was at the north end or because it was more shaded than the north end in the winter sunlight. One buck was observed occasionally in a low sturdy willow tree crotch about 1.5 feet above the ground, although more frequently he was seen in a ground form a few feet from the tree. One day the male was observed to climb into the low crotch, jump to the ground and return to his form several times in succession. The willow, closely pruned, had several thick slanting branches, permitting rather easy climbing. Once, the buck was noted in a crotch of the willow six feet above the ground, and at an observer’s approach he jumped to the ground.

Tandem chasing was observed at times together with occasional interference among the participants. Although the observed fighting was less than in the previous year, the first-trapped doe was found dead between a nail keg and the court wall in mid-February. Most of the hair and skin had been torn from the rear of her back presumably by one of the other cottontails. On March 1 the first-trapped buck was released from the court after receiving injuries in attacks by the other male.

64

Ames Forester
With only one pair remaining in the enclosure we thought their affairs would run smoothly. But the doe more viciously than any rabbit we had observed repeatedly attacked the lone buck. Hence a cage, 5 feet square and 4 feet high, was constructed of meshed wire fencing to enclose one of the pair except when an observer was at hand to protect the male. A shelter keg was placed in the cage and burlap was tied to a height of eight inches at the sides to prevent injury when a rabbit batted itself against the fencing. The doe never rested while observed in the cage. She pawed at the burlap and several times was seen to tug at it after seizing the cloth with her teeth. Often she stood on her hind feet and tried to force an opening in the fencing above the cloth. The buck on the other hand was much less restless in the cage than the doe.

When both were released in the open court the buck nearly always tried to keep a safe distance from the doe. Twice he tried to hold his own against the attacks of the doe, but he soon fled from the persistent pummelling by the jumping doe’s feet.

When we placed both rabbits in the cage the male usually had an even worse time with the female. There he did not fight back except feebly when cornered. On one occasion it appeared that a successful mating would occur. The male, following a cautious approach, placed his fore feet on the back of the resting female, and then retreated. After the third repetition of this procedure the female, after moving slowly towards the male, on reaching him attacked vigorously with her fore feet. Then, as previously and at several cagings afterwards, the two were separated, we hoping the male was not seriously injured. But by mid-March he was dead and internal congested areas indicated the female’s responsibility.

On March 29 another trapped buck, after a week of confinement, was released in the court with the female. They were left free in the enclosure during the nights, and one or the other was kept in the cage in daytime when we were at classes. In general the female behaved as with the other buck, but the new male was an able fighter and we expected an eventual mating. Then the male without an obvious sign of illness lost flesh rapidly and by April 10 it seemed advisable to release him while he was still alive.

The doe was kept in the court several weeks longer as we expected to trap another male, but were not successful. The female one night dug a hole about six inches wide and eight inches deep under a barberry but examination did not reveal pregnancy. She did not carry any materials to the hole and we

*Nineteen Forty-three*
never saw her near it. The earth which she had scratched out in front of the hole and tramped down furnished us with a clew, however, which encouraged our more vigorous search for nests in the fields which up to this time had been disappointing. Our court studies were discontinued with setting the lone female free in May.

On April 19 a young cottontail with eyes closed was brought to us, and we decided to observe it more closely than those of the previous pair. As on the next day its eyes were open, we set its age at about 10 days. After a day of the usual frequent feeding on warm sweetened milk from an eye-dropper it was noted to munch a stem of dry grass in its bedding material. Fresh grass offered at once was not taken, but on the next day it fed again on dry grass. At the age of 12 days it sat up and washed itself as though well-experienced in the art. At 13 days of age it ate some green grass and took less milk than on the previous day, and at 14 days reversed the proportion. Carrots, lettuce, green grass and some milk were taken at 15 days. At 16 days as we tried to feed it milk the young cottontail surprised us by going into spasms. On its 17th day the juvenile had more spasms and several times went through queer antics such as walking on its fore feet only and either dragging the hind feet or holding them above the floor. We thought it dead two or three times. But those spells were short and in between it ate well on carrot, lettuce, and milk. A Senior veterinary student, who late in the day saw the cottontail in a spasm, suggested ear mite trouble and treated it by moistening the ear canal with cigaret lighter fluid on a match-cotton swab. The rabbit had no more spasms. In 1939 we found a juvenile in the field acting in like manner which responded to similar treatment and was turned loose after several days. At 18 days we discontinued the milk and as water was not taken only plant material was supplied thereafter to the young animal which we kept until eight weeks of age and then released in the open. During the last five weeks it fed on several species of grass, white clover, lettuce, and dandelion, with decided preference for dandelion.

Locating Cottontail Nests

Theodor R. Swem, For. '40, who joined the group in the search for nests in the spring, 1938, was the most successful in that phase of the study. The search was conducted mostly on College land and some nests were shown to us by workmen who found them accidentally.
Hunting nests was discouraging for none of us knew a systematic approach. That had to be developed. We first looked in grassy places near shrubbery, particularly where adult cottontails were seen. Not once did the presence of a tarrying adult lead to or bring us near a nest. Only once did we see an adult apparently watchful of our presence at a nest. While two of us stooped to peer into a nest previously found we heard a thump on the hard ground, looked in the direction from which the sound came, and saw an adult cottontail about 25 feet from us stamp the ground twice with its fore feet. In a moment it retreated to nearby tall grass which concealed it from our view.

Of a total of 21 nests found in the spring, 1938, 5 were in nursery seed or seedling beds, 1 in a forest nursery pit, 2 in hayfields, 3 on the campus lawns, 1 in a vegetable garden, 1 in a strawberry patch, 2 in a grape vineyard, 4 in oat strawstacks, 1 in open woods, and 1 in a grassy fence row. All but three or four of the nests were on level ground.

The closest vegetation tall enough to conceal an adult rabbit, or to act as a hazard behind which the animal might dodge when pursued, was observed within 5 feet of six nests, 5 to 10 feet from two nests, 10 to 20 feet from four nests and over 20 feet from nine nests.

Twelve of the nests had 75 young cottontails, with a minimum of 3 and a maximum of 12 to a nest. The 12 in one nest were clearly of two sizes, evidently litters of two females. The members of one nestful of nine were of so nearly the same size that we concluded they had but one mother. As the female cottontail has only eight teats we wondered how the litter took turns to receive equal feedings. The average number in a litter was 5.7 young.

The only extensive cottontail nesting article up to that time (Trippensee, 1936) reported 3 nests observed in cut lawns, 2 in open hardwoods, 4 under conifer trees, 2 in flower beds, 1 under briers of fence rows and 3 in open fields, a total of 15 nests of which 6 contained young. An average of approximately five young was found in 27 litters reported by observers to Trippensee who advised additional work on cottontail production because "life history and life requirements of cottontails are different in different localities from southern Michigan" where he worked.

To obtain an estimate of the numbers of cottontails on College lands, Wayne Chambers, For. '39, volunteered his services. He spent 23 hours a week for five weeks in June and
July, 1938, walking over different paths each time out and counting observed and flushed cottontails. A total of 129 rabbits, 83 adult and 46 young, were seen. The flushing rate was 1.1 cottontails an hour which according to an inventory formula (Hendrickson, 1939a) represents a population density of about 1 cottontail to 3 acres. As all of the college lands are a preserve the surplus is not taken where produced. Many drift off and are shot on immediately surrounding areas.

Between March and November, 1939, 1940, and 1941, we found 126 nests on 288 acres of selected fields in Davis and Wayne Counties in southern Iowa and in centrally located Boone and Story Counties. The spring populations were estimated at 0.3 to 2 cottontails an acre (Hendrickson, 1940a, 1940b). The fields varied in area from 5 to 12 acres and each bore, or had adjacent, good shelter cover suitable to cottontails. The cover of the separate fields ranged from closely grazed bluegrass to lightly pastured well-shaded woods, including unmown weeds, timothy, clover, garden crops, orchards, groves, lightly pastured clearings, and rural school yards.

The most productive nesting tract, a lightly grazed clearing with partly sprouted stumps, bore about one nest to an acre in 1940. A woven wire-fenced rural school yard, carrying bluegrass and sweet clover ground cover, a dozen trees and as many stumps, was the banner single acre, yielding six nests in 1940. The nests were found as the workers walked across the fields at intervals of about eight feet one or two times a month. The nest-containing pockets in the soil averaged about 4 inches in depth, 5 inches in width and 6 inches in length, and in nearly all cases slanted back under the soil surface. A patch of bare soil about 6 inches in diameter, dug out and tramped down by the female cottontail in the nest pocket excavation, was visible in front of most of the nests. In clearings nests were found often at the bases of stumps when the young cottontails revealed themselves by wiggling the nest contents or by squealing in response to the searcher’s prodding with a stick. Usually the soil platform and the nesting material of the stump nest were covered with old leaves so well that one could not visually detect the nest. The nest material of an average nest was about one-third hair and two-thirds soft plant material, usually grass.

**Nesting Data**

An average of about four young to a litter was found in 18 nests discovered by us and an average of about six to a litter was reported by gardeners in 15 nests, of which one contained...
11 young of two sizes and one had 12 young of two sizes. About five young cottontails composed an average litter. Slightly more than one-half of the nests were judged to have been used, i.e., young had been placed in them. About two-thirds of the used nests brought off young successfully.

Although March nesting is reported occasionally, the research workers found none in that month. In the quarter, April through June, about two-thirds of the nesting occurred, and about one-third in the quarter, July through September. No nest was known to have been used in October or later in the year. Hence, it is probable that in a year a female bore two to four litters averaging five young, or 10 to 20 offspring, of which about two-thirds, 7 to 14, left the nests but not all of which survived until fall.

Factors Affecting Cottontail Survival and Management

Inventories of 150 acres of college arboretum and adjacent orchard in 1942 showed a spring seedstock of 28 cottontails and a fall number of 74. The production rate of cottontails was about 164 percent on this non-hunted tract where we have not found tularemia. An average female cottontail produced about three young in the summer that lived into fall. That production rate is not necessarily transferable to all other areas of the state. Rather that rate is indicative of production on an area carrying seedstock near or to its full capacity as conditions are. In other words, the survival rate does not greatly exceed the death rate when winter loss by continued predation and drift from the tract to adjacent shooting areas are considered in the life equation. We accounted for a loss to predators and from drift to shooting areas of 32 cottontails in winter 1940-41, following a 1941 seedstock and production about the same as this year. In fact, although our population and production data on this tract were similar in each of the successive past six years, we have greater confidence in the data of 1941 and 1942 than in the other years because our refined inventory techniques yielded comparable results with more individual observers.

In 1941 we were afforded an opportunity to observe the effects of burning cover on rabbit production (Hendrickson, 1941). About 50 acres of the college arboretum were burned over late in winter, 1940-41, and the tract was mowed several times in the following summer. Following the burning, the remaining cottontails were found in natural hollows, in shelter of old herbaceous stems, and in shallow burrows apparent-

*Nineteen Forty-three*
ly excavated by the rabbits. Two cottontail nests were found on the tract in summer, 1941, whereas there were eight nests, 1940. But as stated in the previous paragraph the production on the entire 150 acres of arboretum and orchard was not decreased apparently.

Our first article on the cottontail (Hendrickson, 1936) dealt with observations on a 15-acre tract on which nine adults and four juveniles were found in June and July, 1935. By fecal pellet-count distributions nine feeding or daytime territories were outlined to average 0.33 acres for an adult cottontail. We were not able to suggest the areas of any other types of territories at that time. No doubt the summer home ranges of these adults were 7 to 20 times their feeding territories, as then interpreted, in light of many observations made on individual rabbits early in morning and evening in later years on that tract. Since that time we have seen three to six cottontails in tandem chase several times in spring on this 15-acre tract of which the cover has not changed materially in the past six years. We have observed such a chase, probably involving more than one female as well as several males at times, move over 5 to 10 acres in less than an hour. In winter individual tracks have been traced over a maximum of 10 acres of the tract and 5 acres of adjacent land.

Preliminary general advice on cover management was offered (Hendrickson, 1937) as shown in the following quoted summary, applying to conditions as of 1934-1936, inclusively. “Cottontails in Iowa have decreased markedly in the last several years. This is particularly true in some southern and western counties because of drought and insect damage to food and cover; perhaps, too, because of wart disease and some parasites, and probably because of increased predation by foxes on heavily diseased and parasitized individuals in winters of heavier snow and sleet. Destruction of grasshoppers by poisoned bran and chinch bugs with oil barriers on vast acreages has meant for increased cover and food for cottontails. Farmers and sportsmen through conservation officers and county agricultural agents were furnished with information from the college investigations of several sorts which suggested that planting of shrubbery in gullies, some covering of vegetation on the soil throughout the year and feeding of fruit tree prunings to rabbits in winter are better agriculture and cottontail management; cottontail management may be enhanced by protective cover at intervals of approximately 200 yards; interspersed corn, small grain and hayfields furnish food, loafing, play and
rearing cover. It was shown in several formal demonstration areas and on many other farms that farmers and sportsmen are cognizant of the facts and willing to cooperate in cottontail and other game management.” See Hendrickson (1938) also.

In 1938 cottontails began to die of tularemia in scattered areas (Hendrickson, 1939b). The epizootic reached its peak in 1939, decreasing markedly in 1940. The disease took a greater toll of rabbits in southern counties than in northern counties, and although the disease has not disappeared the animals are increasing in those areas heavily depopulated two to four years ago (Hendrickson, 1942). Tularemia at its peak in man in 1939, was reported on by a member of Iowa State Board of Health (Jordan, 1940) with whom we cooperate, and the disease in domestic animals was reported on by a member of the cooperating Division of Veterinary Medicine, Iowa State College, (Waller, 1940).

An investigation of the parasites of 210 cottontails taken during the hunting season, 1938-39 (Morgan and Waller, 1940), disclosed four species of arthropod ectoparasites, seven worm species, and eight species of protozoa. None was harmed seriously by parasites. Nearly one-third of the rabbits bore

Dr. Geo. O. Hendrickson (right) and Dr. Jose Carvalho examine a rabbit for tularemia lesions.

Nineteen Forty-three
grayish-white necrotic foci 1 to 3 mm. in diameter on the livers, presumably caused by tapeworms which left the livers for the peritoneal cavity. Such spots are confusing to hunters who interpret them as tularemia lesions. The coccidia of Iowa rabbits recently were investigated in some detail (Carvalho, 1942).

The well-known predator on the cottontail, the great horned owl, does not materially affect populations of its prey well situated in suitable cover and with an adequate food supply as shown in an extensive, thorough investigation (Errington, Hamerstrom and Hamerstrom, 1940). The short-eared owl, often numerous in parts of Iowa in winter, does not take cottontails (Swan and Hendrickson, 1938). On the Moingona Wildlife Research Area, a well-known fox range in Boone County, detailed research for three years showed that the fox did not measurably modify the cottontail numbers (Scott, 1942). The badger (Snead and Hendrickson, 1942) takes many cottontails, but the prey reserve uses the burrows dug by badgers to such an extent that it is apparent that open closely grazed grassland, not suitable to cottontails without the burrows, is bettered as cottontail environment by the badger activity. Weasels do not decrease cottontails materially (Polderboer, Kuhn and Hendrickson, 1941)

The following advanced students in Economic Zoology have assisted in the cottontail investigations: Dean Eckhoff, Cecil Haight, Harry Harrison, Harry Huizinga, Lee Kuhn, Robert Moorman, Emmett Polderboer, Loren Potter, Maurice Provost, William Sigler, Edwin Snead, Carl Trautman and Richard Trump.

LITERATURE CITED

Carvalho, Jose C. M.

Crouch, W. E.

Dice, Lee R.

Errington, Paul L., Frances Hamerstrom, and F. N. Hamerstrom, Jr.

Gerstell, Richard
Hendrickson, George O.

Jordan, Carl F.

Leopold, Aldo

Morgan, B. B., and Waller, E. F.

Polderboer, Emmett B., Lee W. Kuhn and George O. Hendrickson

Scott, Thomas G.

Snead, Edwin and Hendrickson, George O.

Stuber, James W.

Swan, Charles and Hendrickson, George O.

Trippensee, R. E.

Waller, E. F.
1940. Tularemia in Iowa Cottontail Rabbits (Sylvilagus floridanus mearnsi) and in a Dog. Vet. Student. 2:54, 55, 73.

Nineteen Forty-three
THE TREES

The poplar is a French tree,
A tall and laughing wench tree,
A slender tree, a tender tree,
That whispers in the rain—
An easy, breezy flapper tree,
A lithe and blithe and dapper tree,
A girl of trees, a pearl of trees,
Beside the shallow Aisne.

The oak is a British tree,
And not at all a skittish tree,
A rough tree, a tough tree,
A knotty tree to bruise;
A drives-his-roots-in-deep tree,
And what-I-find-I-keep tree,
A tree of stubborn thews.

The pine tree is our own tree.
A grown tree, a cone tree,
The tree to face a bitter wind,
The tree for mast and spar—
A mountain tree, a fine tree,
A fragrant turpentine tree,
A limber tree, a timber tree,
And resinous with tar!

—By Christopher Morley
Wartime Marketing of Products of Iowa’s Woodlands

By GUY E. RAMSEY
Extension Forester

If we are to consider the marketing of products of Iowa woodlands, we must first take considerable time to look into the events of the past which have had vital effects upon the condition of the woods.

CONTRIBUTION OF THE WOOD RESOURCE TO THE DEVELOPMENT OF AGRICULTURAL INDUSTRIES

There stands a colossus in Iowa. His name is Agriculture. His gigantic stature overshadows the land. He is unchallenged. While some states of our Union may have had Lumbering as a colossus, only to have him tumbled from his pedestal, in Iowa Lumbering never was more than mansized. Yet Lumbering suckled the colossus of Iowa.

Early pioneers of Iowa built their homes of Iowa wood. Log cabins housed the first Iowa farmers. From Iowa’s woods came the cribs to store the first corn crops. From Iowa’s woods came the posts and rails to enclose the first Iowa pastures.

More than that! Settlers in many Iowa counties bought land, cut timber from it, sold the lumber and received enough from the sales to recover the entire purchase price of the land, and, in addition, have enough money to buy all the agricultural implements and livestock necessary to start themselves in the farming business. All this from the timber—the land free of debt, houses, barns, cribs, shelters, livestock, seed for the crops—all paid for by the timber. Even to this day in parts of Iowa this can be done, where only a portion of the land is a transaction may be in timber.

TREATMENT OF THE TIMBER STANDS

Whatever else the pioneer was, once he had settled in Iowa he became a farmer. When he surveyed his land he saw only fields of grain or pasture. If there were remnants of the woodlands they must go! Every acre must be in grain or pasture!
Wave after wave of timber cutting passed over the land. Each wave carried on its crest the best trees from the woods, and when each wave had ebbed there stood only stumps—stumps or the unwanted trees, trees too crooked, too old, or too diseased or infested. Even the young trees were taken. If the youthful tree would provide a post or a pole it fell before the axe. The smoke of brush burning hazed the hills in the fall, and made the horizon blue and indistinct in spring.

Yet, despite the cutting, there still were woods in Iowa. Whereas there was in early days within Iowa’s borders 6,680,000 acres of timberland (one-fifth of the state), more recent tabulations indicate nearly two and a half million acres remaining. Each wave of cutting had cleared more, until at the present practically all land originally in timber and suitable for crops or pasture have been removed. The present acreage of Iowa timber is on land which is best suited for timber growing.

Yes, Iowa’s present timber acreage is timber land—not crop land or pasture land. We will not consider here that some of the cleared land was never suitable for crops or pasture or ever will be. Not that we could not. We need only to look over thousands of acres of worthless lands, with top soil gone, deeply gullied, abandoned farm houses, collapsed barns, toppling cribs, and sagging or down fences, for proof that much cleared land failed as agricultural land in spite of the “stake” which timber gave it.

Lumbering is not bitter over what has happened in Iowa’s timberlands. Rather, it is with pride that Lumbering will count and recount the farm homes, barns, cribs, churches, schools, towns and even cities which it has helped to build on once timbered slopes. Great pride swells, too, with the thought that most once-timbered lands can produce bumper crops of grain and fatten herds of cattle, sheep and hogs.

But what of the present timber acreage of Iowa? Is it really timber? Is it good timber? Does it produce good crops of wood? We must answer these questions.

Not content with the contribution Iowa’s timberlands have made to its growth and power, Agriculture has exacted a heavy toll from the remaining stands of timber. The woods have suffered the indignity of being pastured. Year in, year out, young trees have been cropped to the ground until their places have been taken by grass or brush. The woods, never a pasture, became less and less a woods and more and more an unprofitable pasture. Owners admit the worthlessness of timber pasture, but feel forced to keep the livestock in “to get something
off the land.” Roots of the remaining trees are damaged by the trampling of sharp hoofs, each wound an entry for root disease. Even fire is used “to improve the pasture.”

And so the woods, forced to serve as a slave in pasture, denied its right to reproduce, becomes less and less a woods. The trees which stand represent the leavings, the cast-offs, the unwanted, the rejects.

IS THE INCOME FROM FARM WOODS COMPAREABLE TO OTHER AGRICULTURAL INCOMES?

Too often in this depleted condition the woodland is challenged to prove that its products can compete with those of agriculture. The years have brought new owners who saw not the woods when they were productive. Reason with them to give the woods a chance to prove that it can grow profitable crops? “First,” they say, “show us where we can make some money from the already standing trees before you ask us to attempt to grow future crops of wood.” Is it proof to them that the farm itself was born at the sacrifice of the forest? Recently an agricultural worker demanded that a forest worker prove that the forest crop could compete with the agricultural crop. Reasoned the agriculturist, “This is wartime. Lumber is scarce, prices are high. If ever there was a time that woodland products should be profitable it is now. Yet no one is able to sell logs.” Replied the forester, “The woods you speak of are not woods. Agriculture has forced them to be pastures. The trees therein are the remnants of former woods. There is not a good log among them. For your agricultural crops you have prepared the ground carefully, you have developed the best seed, you have invested much money in implements to till, tend and harvest, you have built barns and cribs and bins, and you have cooperated with your neighbors to get the best possible price. What have you done to your woods? You have developed your livestock as purebred, you have purchased and grown for them the best of feed, you have sheltered them from weather, immunized them from disease, protected them from insects, and cooperated with other livestock men to develop the best market for your animals. What have you done for your woods? How can you expect to compare the products of the woods which have suffered continuous exploitation and enjoyed no development with the products of industries which have been developed to near perfection without sparing the expense?” The wonder of it—is that the woods have survived at all. The truth is that, with all its mistreatment and neglect,

Nineteen Forty-three 77
the woods have continued to yield fence posts, poles, fuelwood, occasional batches of logs, and are capable of yielding more material now that wartime demands have forced us to look to our Iowa woods for lumber and timber which cannot be had from other regions.

MARKETS FOR IOWA WOOD

As has been indicated, Iowa woodlands have contributed greatly to the development of Iowa's chief industry, Agriculture. The presence in eastern Iowa and western Illinois of supplies of ample hardwoods suitable for use in agricultural implements was largely responsible for the development of the implement manufacturing business about Rock Island, Moline and Davenport. With the dwindling of the supply of hardwood in this region the implement business turned more and more to metal.

George B. Hartman in "The Iowa Sawmill Industry," in the Iowa Journal of History and Politics, January 1942, Volume XI, Number 1, showed that the decline in the production of lumber in Iowa was due to: 1. Decline in forest area; 2. Decline in quality of the timber; 3. Reluctance of Iowa's wood-using industries to use lumber sawed in Iowa.

The presence in Iowa of hardwood species with durable wood contributed greatly to the extension of railroads throughout the state by providing ample supplies of ties, piling and bridge timbers.

Sawmills of all types have served the farmers more than industrial plants. At present there are about a thousand mills in Iowa, a considerable reduction in the last twenty years. Most of the mills are portable and move about to wherever farmers may have a few trees to saw. Their method of doing business is usually crude. They will charge probably from $5.00 to $10.00 per thousand board feet for sawing. Very few sawmillers buy logs, and fewer buy standing timber because they have no outlet for the material. Few keep records of the amount of material they cut and many do not keep accounts.

The portable mills rarely saw material which is true in dimension. In this way they are wasteful because the lumber they produce can be used only for the crudest structures or for the crudest uses in common farm buildings. Few mills have auxiliary equipment which might enable them to resaw slabs for small dimensions or to plane, resaw or otherwise remanufacture lumber. Rare indeed is the millman who dries his lumber.

Ames Forester
before it is used or sold, and he is incapable or disinterested in advising the farmer for whom he saws how the lumber may be piled for proper air-drying. Furthermore, the millman has become an advocate of the use of green lumber, for he finds that it is easier to get custom sawing where the log owner can immediately use the newly-sawed lumber. This practice appears to the millman as the only one which will enable him to compete with the lumberyard who delivers lumber on demand. So ingrained has become this practice that many millmen actually believe that native Iowa woods can only be used green. They have accepted the arguments, against the use of it dry, as unsurmountable, actually using the arguments to get orders for green lumber or to convince the farmer that he should use native lumber green.

The portable mills have been called upon to “clean-out” the woods, thereby cutting small, thrifty, growing trees without getting much lumber, but at the demand of the farmer who wants more grass in his woods in order that they will be better pastures. Few millmen have realized that this practice has made them little if any profits, and has, in addition, lessened their chances to establish and maintain a good business for themselves as sawmillers. Many millmen maintain that the only way they can get custom sawing is to take the “clearing” jobs, or to saw small trees.

Some few sawmillers buy tracts of timber. Rarely do such millers buy timber by scale, but their purchases are on the lump sum basis. A walk through the timber with mental notes on what it contains results in an offer which is usually in the $100 class, seldom are the offers on a board foot or piece basis. The farmer who sells rarely knows the volume contents or the quality of the materials he sells. More often he is primarily interested in having the land cleared and getting a “little something for the trees,” than in selling a product for all it is worth. The buyer, under such circumstances, is urged by the seller to “take everything” regardless of size. The buyer therefore makes an offer which will enable him to cut both the small and large, good and bad trees. Sales of timber are so few that no established stumpage prices have been developed for many years. However, sales range from $1.00 to $20.00 per thousand, with the majority from $5.00 to $10.00.

Within recent years the mills have protested that the farmers cannot cut logs correctly, consequently they cannot buy logs from the farmers.

The mills who buy and sell material dispose of their prod-

*Nineteen Forty-three*
ucts to tie buyers, to box factories, for bridge timbers, for
foundry forms, and an occasional sale is made to the few wood-
working or wood-using industries which remain. The latter,
however, prefer to buy material from mills who do a better job
of sawing, supply dry material, and supply it consistently, all
of which few Iowa mills are capable of doing.

The most regrettable practice is that of the so-called "tie-
hacks." These are ordinary portable or crude stationary mills,
financed usually by an out-of-the-state firm. The hackers buy
pieces of timber by lump sum, or with the tie as the unit of
measurement. Prices paid vary from 4 cents to 25 cents per
tie. The contract, if the parties bother to write one, stipulate
that payment is to be made for the timber at so much per tie.
Rarely is mention made of the clear lumber which a log will
yield outside of the inner tie timber, which goes to the tie-
hack "for producing the ties." This lumber is shipped to the
financing company or sold locally to any takers, usually at fair
prices. Since such lumber is from the outer portion of large
logs it grades high. The piece of timber is left worthless as
producing timber, any tree small, or large, which will make at
least one tie is taken. Tie-hackers have been fortunate enough
to be the only ones bidding for many good timber tracts. In-
variably the sellers have, too late, regretted the sale.

WARTIME MARKETS FOR IOWA FOREST PRODUCTS

Raw Material—Stumpage prices have not become any more
clearly defined in spite of more demands for the materials of
the forests. Nor have the sales been for a higher price. Sales
have been for the low range of from $10.00 to $20.00 per acre.
(Note the continued practice of selling without knowledge of
the true content of the stand.) Stumpage deals have been from
$4.00 to $10.00 per thousand board feet, Doyle scale.

Mills continue to dislike to take logs from farmers. This in
spite of shortage of labor to get out the logs themselves.

In northeastern Iowa war industries have been actively buy-
ing basswood. Basswood has been bought at $10 stumpage; red
and white oak and hard maple, $7 to $12; cottonwood, ash and
elm, $8, by mills who convert the logs into box material. Bass-
wood and maple logs sell at $35 per M at the mill, cottonwood
at $25 per M. Basswood and maple lumber at mills will sell
at from $35 to $45 per M., and cottonwood $25 to $30.

White oak has been sold only in very limited amounts. Spe-
cifications for war purposes have been so high that little suit-
able material is found in Iowa.
Numerous buyers are asking for logs and lumber at prices too low to induce a large flow of material. Species sought are basswood, oak, birch, elm, cottonwood and ash. Most mills consider it more profitable to saw on custom for farmers or saw for the farmer trade. This is more true in southeast Iowa than in the northeast. Farmers are paying from $30 to $50 per thousand board feet for native lumber, according to grade, size and species.

Black Walnut—Walnut has an individual status. A material which has always commanded a good price for good material, walnut is now sought in considerable quantity for gunstocks, war-planes and fighter boats. Five mills turn out gunstock blanks, two at Dubuque, and one at West Des Moines, Burlington and Council Bluffs. Many small mills saw walnut flitches to supply to these or other plants. In addition there are several buyers, notably at Des Moines, who buys for shipment to Kansas City. Prices to the owners vary from $50 to $250 per thousand board feet at mills. Walnut buyers encounter many difficulties in obtaining material. For gunstocks the material must be clear of all defects, even small sound knots. A good price is paid for trees which will produce gunstock material. Sales at good prices lead tree owners to think they have high value material in every walnut tree on their place, whereas, high quality trees are not common. Unfortunately the sales at high prices have received considerable publicity which has not emphasized the fact that high-value walnut does not "just grow," but needs to be developed under favorable forest conditions. Walnut trees in yards, along fence rows, and in pastures are rarely high quality trees. They are apt to be short-trunked, crooked, defective, or to contain metal. Buyers spend much time, travel and money locating material, much of which is spent in looking at trees which they will not buy. Furthermore, walnut owners who have good material may hold out for higher prices and occasion more and more travel, time, and expense on the part of several buyers, in efforts to buy the logs to meet their contracts. During wartime when travel is restricted and labor conditions are a big factor, there is a great need to determine where merchantable material stands and in what quantity it can be obtained in order to speed up production of a material badly needed for the war effort.

MARKETING PROGRAM OF PUBLIC AGENCIES

Extension Service of U. S. Department of Agriculture

This work is carried on by extension foresters attached to

Nineteen Forty-three  
81
the staff of Iowa State College. The extension foresters devote their entire time to farm forestry education. With the advent of World War II the extension program was modified to enable the greatest contribution to the war effort. Stated in outline form the objects of this program are:

a. Prevent serious destruction of the woodland resources.
b. Promote local use of home-grown wood to replace wood from other regions or other materials in war industries and to release shipping facilities for war purposes.
c. Supply farmers with building material needed to produce, harvest and store larger wartime stocks of food.
d. Stimulate production of fuelwood to avoid critical fuel shortages and to relieve transportation facilities.
e. Protect farmers from unscrupulous buyers and help them market woodland products at fair prices.

To enable the extension foresters to cope with the varying problems in different parts of the state, the state is divided into ten geographical units. Each unit is suitable for handling by one extension forester.

In each county where extension work in wartime marketing of forest products is carried, a committee on farm forestry is set up by the County Farm Bureau. The Farm Forestry Committees consist altogether of farmers, but a business man or a sawmill operator may be one member. These committees formulate (a) a long time plan for farm forestry in the county; (b) formulate policies under which the work will be carried out, and (c) make contacts for and grant authority to the farm foresters.

**Woodland Phase**—The plan involves a woodland phase by which the farmers are given assistance in (a) estimating merchantable timber; (b) measuring and marking timber for various wood products; (c) estimating home-use needs; (d) estimating surplus material which could be sold; (e) aid in locating sawmills; (f) aid in cooperative use of tools, equipment and labor; (g) recommendations on methods of falling; log-making, transporting, peeling or barking of logs; and the use to be made of poor logs and slashings; (h) recommendations for future use and care of woods.

**Marketing Phase**—The marketing phase of the work involves the direction of woodland products to the home market, the farm, preferably the farm on which it is grown or in the immediate neighborhood, and to war industries. In each county lists are to be maintained of (a) farmers having timber, lumber and timber products for sale; (b) “outside markets;” (c)
sawmills; (d) wood or lumber needed by farmers. Every possible aid is given to farmers who need lumber or timbers, posts or fuel-wood in order to keep them producing a maximum amount of food.

Aid is planned for groups of farmers in arranging financial backing to accumulate and season native wood on their farms or for immediate local distribution.

The farm forester or extension forester assists in contacting sawmills, furnishing information on mill, drawing up sales contracts, and furnishing information on uses of native wood on farms.

As a sub-phase of the marketing phase of the program special attention is given to the marketing of black walnut for gunstocks, war planes and fighter boats. The feature of this is an inventory of the existing merchantable black walnut which will place in the hands of the government the exact location of all standing black walnut trees. This could be used in case an organized plan of getting the material is necessary.

All producers of walnut and all manufacturers of gunstocks will be located and their needs determined. Efforts will be made to direct a steady flow of black walnut to supply demands to keep the guns, planes and ships rolling off production lines.

Farmers will be given instructions by groups or by printed material, radio and newspaper articles on how to determine if they have suitable walnut material, on how to get it out, and to contact markets.

Sawmill Phase

This phase is predicated on the premise brought out in 1926 by C. L. Harrison in a thesis for Master’s Degree at Iowa State College that, “Iowa produced lumber will not regain its lost prestige until improved methods of sawing, grading, and seasoning have placed it on the same quality level as lumber imported from other sections of the United States.”

All sawmills are located and information secured on their facilities, abilities, capacities, and practices. Information is supplied to mills on methods of improving their methods of manufacturing and increasing their capacities. Mills are encouraged to practice seasoning of lumber. They are supplied information on logging equipment and methods. Aid is given in locating available timber and in the exchange of equipment and labor. Information is given on markets for lumber and woods products. Sawmillers are acquainted with the objectives of timber management and their cooperation is solicited

*Nineteen Forty-three*
in attaining the objectives set up by the county farm forestry committee.

Fuelwood Phase

Anticipating the possibility of a fuelwood crisis during wartime, the program provides for (a) the production of fuelwood in all localities where the material can be had; (b) promoting wood cutting projects by farmers, neighborhood groups, 4-H Clubs, rural youth groups, and others; (c) and distribution of fuelwood to distressed communities.

In the entire conduct of the extension program full use is made of newspaper and radio facilities.

Special Marketing Facilities

Late in 1942 the United States Forest Service initiated special action programs to expedite the flow of woods material to war industries and to farms where it would aid the farmer to keep his food production up. This work was conducted in cooperation with the Iowa State Conservation Commission under direction of G. B. MacDonald, State Forester. Three farm foresters were placed in three districts in eastern Iowa under this program. A farm forester of the Soil Conservation Service located on a special woodland management project in Allamakee County works cooperatively with both the Extension Service and the Forest Service-State Conservation Commission Marketing Programs.

A FOREST HYMN

The groves were God's first temples. Ere man learned
To hew the shaft, and lay the architrave
And spread the roof above them—ere he framed
The lofty vault, togather and roll back
The sound of anthems, in the darkling wood,
Amid the cool and silence, he knelt down
And offered to the Mightiest solemn thanks
And supplication.
OUR FORESTS AND THE WAR

Man the axe, the saws, the peavies;
   Lay the forest giants low!
In our nation's arms and navies,
   Timber now to war must go!

In the crushing of our enemies,
   Wood must play a major role;
Nations wrung by tragic conflict
   Cry for help from pole to pole.

Landing wheels, invasion barges;
   Tank obstructions, rifle stocks;
Skiis and and staffs and bombing charges,
   Pontoon bridges, wharves and docks;

Lacquer, pulp and turpentine
   Products from the forest hail;
Coat propellers spreading wings,
   Masts and spars and wooden rail.

Anti-moisture impregnate,
   Insulators, gasogene,
Poison masks, torpedo tubes,
   Rayon chutes and cellophane;

Desks and tables for the mappers;
   Both at home and over-sea.
Photo films and cartridge wrappers;
   Flour of wood for TNT.

Bombers, fighters, cruisers, chasers,
   Fashioned from the nation's store.
Submarines and "Battle Wagons."
   Swell production more and more!

Blitz and blast the foes of freedom
   From the land, the sky, the sea!
And restore our peace and comfort
   Certified by Liberty!

—J. A. Larsen
Presenting

LYLE WATTS

It is indeed a rare occasion when a forestry publication has the privilege of presenting from its ranks of graduates a Chief Forester of the United States.

We, the students who are now studying forestry and those who will follow us, are fortunate in having such an illustrious alumnus to inspire us to greater achievement.

We realize that no matter where he attended school, he possessed those qualities which would have inevitably led to his success. Iowa State was truly favored in drawing such a person into that small class of forestry students in 1909.

Born in Lincoln Township, Cerro Gordo County, Iowa, on a farm seven miles north of Clear Lake, Chief Watts attended Clear Lake High School until his junior year when his family moved to Bellingham, Washington in 1907. He returned to Iowa with his family in the fall of 1908, and graduated from Clear Lake High School in 1909.

Watts entered Iowa State College in 1909 and graduated in 1913. While in college he participated in debate, and was active in Forestry Club activities, being one of the early framers of the present constitution.

Immediately after he graduated from Iowa State Watts entered the U. S. Forest Service as a field assistant. In a short time he was advanced to Assistant Forest Supervisor of the Idaho National Forest.

In 1928, after being granted a degree of Master of Forestry at Iowa State, Watts took a position as head of the School of Forestry at Logan, Utah. After three years he accepted a position as Research Silviculturist, and Director of the Northern Rocky Mountain Forest and Range Experiment Station. Six years later he was appointed Regional Forester of the North Central Region in charge of work over nine states. In 1939 he was made Regional Forester of the Northern Pacific Region. Shortly before his appointment as chief, he was called to Washington to act as an assistant to Secretary Wickard on matters related to farm labor.

The rapid advance to the highest position any forester can wish to achieve is proof of his outstanding abilities. We feel confident that with his guidance vast improvements in the fields of forestry will be accomplished in the future.
DEPARTMENT

FACULTY
SENIORS
UNDERCLASSMEN
ACTIVITIES
FRESHMAN CAMP
STAFF

Great things are done
When men and mountains meet.
These are not done
By jostling in the street.

Nineteen Forty-three

89
FACULTY

Professor G. B. McDonald
Professor G. M. Genaux
Professor A. W. Goodspeed
Professor J. A. Larsen
Professor G. B. Hartman
Professor A. L. McComb
Professor Guy R. Ramsey, Extension Forester
Professor Odell Julander, Asst. Extension Forester
SENIORS

He who ascends
to mountain tops shall find
The loftiest peaks
most wrapped in clouds and snow—
He who surpasses
or subdues mankind,
Must look down
on the hate of those below.
MARLOWE BURGY
Ames, Iowa
Camp: Jemez Springs, New Mexico, 1940.
Experience:
Farming, South Amana, 9 months.
Station Attendant, 6 months.
U. S. Forest Service, Bunker Missouri, Research Assistant, 3 months.
Gamma Phi Beta Sorority, Ames, Iowa, waiter part time, 3 years.
Activities:
Forestry Club 1, 2, 3, 4.
Cross Country running 1, 2, 3, 4.
Track 1, 2, 3, 4.
T-Club 2, 3, 4.
Agriculture Council 3, 4.
Student Deacon, Presbyterian Church 3, 4.
Cadet Officers’ Assn. 3, 4.
Ames Forester 4.
Hoedown Chairman 4.
Pack Essay Contest 2nd prize 2.
FarmHouse Fraternity.
Alpha Zeta 4.

WILLIAM W. CHILCOTE
Washington, Iowa
Camp: High Rolls, New Mexico, Lincoln National Forest, 1941.
Experience:
U.S.F.S. Range Experiment Station, Ephriam, Utah, field assistant, 4 months, 1941.
I.S.C. Greenhouse, 2 years part time, 1940-41.
Wolf Floral Company, 2½ years, greenhouse assistant and clerk, 1936-38.
Grocery deliveryman, 1 year, 1939.
Activities:
Forestry Club 2, 3, 4; Treasurer, 3; Vice-President, 4.
Ames Forester, Art Editor, 3; Editor, 4.
Veishea 3, 4.
Alpha Zeta 3, 4.
Lane-Wells Scholarship 4.

WARREN TRUMAN DOOLITTLE
Webster City, Iowa
Camp: None.
Experience:
Farming, Webster City, 1935-41.
Oil Tank Delivery, Webster City, 2 months.
I.S.C. Agronomy Dept., Ames, Iowa, 5 months.
I.S.C. Botany Dept., Ames, Iowa, 5 months.
Activities:
Forestry Club, President’s Cabinet 3, 4.
Ames Forester, Ass’t Editor, 1942.
Ames Forester, Circulation Manager, 1943.
Intramural Manager of Sigma Pi Fraternity 2, 3, 4.
Sigma Pi Fraternity.

WILBUR H. ENGSTROM
Des Moines, Iowa
Camp: Walhalla, S. Carolina, 1939.
Experience:
Wanbonsie State Park, Park Improvement, 3 months.
Des Moines Wood Products, Millwork, Des Moines, Iowa, 4 years.
Iowa State Nursery, Ames, Iowa, 3 months.
S.C.S., Nursery Work, Ames, Iowa, 1 month.
Activities:
Forestry Club.
MARIO FOA  
Naples, Italy

Camp:  
Lincoln National Forest, New Mexico, 1941.

Experience:  
General ranch work, Woodland Park, Colorado, 1940.
U.S. Forest Service Ranger Station, Woodland Park, Colorado, 1941.
I.S.C. Botany Dept., Ames, Iowa, 10 months, 1942-43.

Activities:  
Forestry Club 4.  
Ames Forester Editorial Staff 4.  
Iowa Agriculturalist 4.  
Cosmopolitan Club 2, 3, 4.

VICTOR LOUIS KREIMEYER  
Geneva, Iowa

Camp:  
Jemez Springs, New Mexico, 1940.

Experience:  
Estacada, Oregon, 1941.  
Mt. Hood National Forest, Fire Suppression, 6 weeks.  
Mt. Hood National Forest, Lookout, fireman, 3 months.  
I.S.C. Forest Nursery, 1942.

Activities:  
Forestry Club 1, 2, 3, 4.  
Glee Club 1, 2, 3, 4.  
College Quartet, Octet 2, 3.  
Phi Mu Alpha Sinfonia, honorary musical fraternity.

RICHARD N. LORENZEN  
St. Ansgar, Iowa

Camp:  
Rapid River, Michigan, 1939; Estacada, Oregon, 1941.

Experience:  
U.S.F.S. Mt. Hood National Forest, Oregon, suppression crew, 2 months, 1941.  
I.S.C. Herbarium, 7 months, part time.  
I.S.C. Seed Laboratory, 3 years, part time.

Activities:  
Forestry Club 1, 2, 3, 4.  
Ward System 2, 3, 4.  
Iowa State Festival Choir 3.  
Collegiate Methodist Choir 3.  
Iowa Academy of Science 2, 3, 4.

CARL ELLIS MAYER  
Cape Girardeau, Missouri

Camp:  
High Rolls, New Mexico, Lincoln National Forest, 1941.

Experience:  
Iowa State Forest Nursery, part time, 3 months.  
Pure Ice Co., Cape Girardeau, Mo., 4 summers.  
Physical Education Instructor, part time at S. E. Mo. State College, 2 years.  
I.S.C. Forestry Dept., Truck Driver.

Activities:  
Forestry Club 2, 3, 4; President 4.  
Officers’ Training, U.S. Marine Corps.  
Intramurals 2, 3, 4.  
Veishea 2, 3.  
S. E. Mo. State College 1, 2, 3; Football 1, 2, 3; Basketball 1, 2, 3, Captain 3.  
President Freshman Class—Varsity Club.
ROBERT E. McDERMOTT
Maywood, Illinois
Camp:
High Rolls, New Mexico, '41
Experience:
Dude Guide, Bighorn Mts. Sum. '36
Amer. Can Co., Maywood, Ill., sum. '40
Richardson Co., Melrose Park, Ill., sum '41, '42
Iowa State College Seed. Lab., 6 mo. '43
Activities:
Forestry Club 2, 3, President 4
Ames Forester 3, Assist. Ed. 4
Agriculturist 4
Newman Club 2, 3, 4
Veishea 2, 3

GEORGE I. PORTER
Squantum, Massachusetts
Camp:
Flagstaff, Arizona, 1936.
Experience:
C.C.C. Iowa, 1935-36.
Fore River Shipyard, Quincy, Mass., 1941-42.
Activities:
Forestry Club 1, 2, 3, 4, Secretary 2.
Wrestling 1.
Roger Williams Club 3, 4.
Ames Forester 4.

EUGENE H. ROGERS
Harlan, Iowa
Camp:
Bernadillo, New Mexico.
Experience:
Drugstore Clerk, Harlan, Iowa, 4 years.
I.S.C. Botany Dept., 3 months.
Memorial Union, 3 months.
Activities:
Forestry Club 1, 2, 3, 4.
Intamurals 2, 3, 4.
Cadet Officers' Assn. 3, 4.
Marching Band 1, 2.

GEORGE W. THOMSON
Pecatonica, Illinois
Camp:
Jemez Springs, New Mexico, 1940.
Experience:
Farm woodlot cruising, Pecatonica, Illinois, 1941.
Farming, Pecatonica, Illinois, 10 years.
Activities:
Forestry Club 1, 2, 3, 4.
Veishea 2, 3.
Ames Forester, Art Editor 4.
Hoedown Committee 2, 3, 4.
Pack Essay Winner 1, 2.
George Dorsett  
Webster Groves, Missouri

Ralph W. Treeman  
Perry, Oklahoma

Warren V. Kraffka  
Elberon, Iowa

Virgil O. Seiser  
Webster City, Iowa

Thos. R. Wood  
Des Moines, Iowa

Nineteen Forty-three
WILDERNESS

There is an eagle in me and a mocking-bird . . . and the eagle flies among the Rocky Mountains of my dreams and fights among the Sierra crags of what I want . . . and the mocking-bird warbles in the early forenoon before the dew is gone, warbles in the underbrush of my Chattanoogas of hope, gushes over the blue Ozark foothills of my wishes—And I got the eagle and the mocking-bird from the wilderness.

O, I got a zoo, I got a menagerie, inside my ribs, under my bony head, under my red-valve heart—and I got something else: it is a man-child heart, a woman-child heart: it is a father and mother and lover: it came from God-Knows-Where: it is going to God-Knows-Where—For I am the keeper of the zoo: I say yes and no: I sing and kill and work: I am a pal of the world: I came from the wilderness.

—Carl Sandburg
JUNIORS
SOPHOMORES
FRESHMEN
JUNIORS

BARRETT, JAMES W. ...............Independence
BROCKMAN, LEONARD W. ...........Berwyn, Ill.
BLANCHARD, JESS ..................Lone Rock
HALBROOK, QUINCY X. .............Little Rock, Ark.
HANSEN, EARL H. ..................Swan Lake, Viborg, S. Dak.
HERRICK, DAVID E. ................Wapello
GARMAN, EDWARD J. ...............Bellwood, Ill.
KUCERA, CLAIR L. ..................Williamsburg
JACK, ROBERT C. ...................West Liberty
KUHNS, PAUL S. ....................St. Louis, Mo.
LANGE, JOHN R. ....................Maywood, Ill.
LOWE, HOWARD E. ...................Thayer
MORLOCK, JEROME F. ..............Des Moines
PICOTTE, GORDON P. ..............Omaha
REYNOLDS, JOE R. .................Ames
SIMS, JIMMIE R. ...................DeRidder, La.
SKVARIL, WARREN J. ..............Wines, S. Dak.
VAN GILST, GERALD ...............Newton
WIECHMAN, RICHARD O. ..........Lake Park

Nineteen Forty-three
SOPHOMORES

ADRIAN, WALLACE L. ....................... Marion, S. Dak.
BERGMANN, HAROLD A. .................... Hampton
BOULT, WILLIAM, JR. ...................... Audubon
BRECKENRIDGE, GEORGE P. ................ Chicago, Ill.
BRAUNLICH, HUGO C. ..................... Davenport
BUCK, DAVID P. .......................... Rhodes
COLBERT, FRANCIS T. .................... Grinnell
DEWEY, RALPH E. ......................... Dubuque
DIRKS, RONALD J. ........................ Akron
DORSETT, ROBERT E. ...................... Webster Groves, Mo.
ELLIS, JOSEPH F. III ..................... Eau Claire, Wis.
FISHER, ROY R. .......................... Davenport
GALER, CARL D. .......................... Ottumwa
HANNA, ROBERT W. ......................... Anamosa
HARTMAN, GEORGE B. JR. ................. Ames
HILL, WENDELL L. ......................... Sutherland
LOEHNDORF, DONALD E. ................. Clinton
LOTTS, LEONARD W. ...................... Oelwein
MADSON, DANIEL R. ...................... Hawarden
MCINTOSH, JOHN C. ....................... Leon
MENDELSON, HERBERT L. ................. Chicago, Ill.
MOODY, ELBREGDE R. ..................... Wilmette, Ill.
OBYE, KENNETH D. ...................... Iowa City
OHLINGER, DWIGHT A. .................... Lehigh
OILSCHLAGER, E. E. ...................... Port Edwards, Wis.
PATTERSON, LLOYD ....................... Cleveland, Ohio
PAULSEN, HAROLD A. ..................... Elgin, Ill.
Plass, WILLIAM T. ....................... Iowa City
PRIEWE, ARMIN L. ....................... Orageville, Ill.
POLLARD, ROBERT L. ..................... Boone
PRESENZA, ALDO L. ....................... White Plains, N. Y.
RILEY, JOHN P. ......................... Lawrence, Mass
THORPE, WALTER R. ..................... Rock Island, Ill.
UHLIG, HAN: ............................. Pittsfield, Mass.
VAN ALYEA, THOMAS C. ................. Park Ridge, Ill.
VARNUM, GEORGE W. ..................... Pasadena, Calif.
VISSER, CAROL S. ....................... Bussey
WADE, ROBERT L. ........................ Ottumwa

Nineteen Forty-three
<table>
<thead>
<tr>
<th>Name</th>
<th>City/Location</th>
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<tbody>
<tr>
<td>Clark, Eugene P.</td>
<td>Dubuque</td>
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<tr>
<td>Crain, Robert V.</td>
<td>Iowa City</td>
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<td>Crowther, Charles R.</td>
<td>Waterloo</td>
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<td>Daib, Leonhardt G.</td>
<td>Dexter</td>
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<td>Davis, Roderick R.</td>
<td>Ames</td>
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<td>DeKalb, Victor M.</td>
<td>Fairfield</td>
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<td>Dunkleberg, James G.</td>
<td>Rockford</td>
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<td>Eilert, John E.</td>
<td>Evanston, Ill.</td>
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<td>Ellsworth, Nelson R. Jr.</td>
<td>Spirit Lake</td>
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<td>Fisher, Marshall D.</td>
<td>Bettendorf</td>
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<td>Funk, Keith I.</td>
<td>Osage</td>
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<td>Glattfelder, Calvin F.</td>
<td>Fairfield</td>
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<td>Goheen, Edward F.</td>
<td>Independence, Mo.</td>
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<td>Goodwin, Carlton B.</td>
<td>Jefferson</td>
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<td>Gossard, Dean C.</td>
<td>Council Bluffs</td>
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<td>Hardin, Harold H.</td>
<td>Keithsburg, Ill.</td>
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<td>Haskell, Albert M. Jr.</td>
<td>Huron, S. Dak.</td>
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<td>Hays, Harold G.</td>
<td>Thompson</td>
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<td>Ihrig, Evered L.</td>
<td>Iowa City</td>
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<td>Jensen, Dale H.</td>
<td>Lake City</td>
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<td>Kingery, Hugh M.</td>
<td>Winnetka, Ill.</td>
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<td>Kyseth, Neil D.</td>
<td>Clarion</td>
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<td>Washington</td>
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<td>Neveln, Kenneth H.</td>
<td>Walnut</td>
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<td>Nyström, Arthur W.</td>
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<td>Perry Carl K.</td>
<td>Beacon</td>
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<td>Peters, Owen H.</td>
<td>Sioux City</td>
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<td>Schleiffarth, Armin D.</td>
<td>Webster Groves, Mo.</td>
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<td>Schwerin, Raymond H.</td>
<td>Waterloo</td>
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<td>Squire, Everett W.</td>
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<td>Warfield, John D.</td>
<td>Riverside, Ill.</td>
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<td>Webber, David H.</td>
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<td>Wheat, Joseph G.</td>
<td>Humboldt</td>
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<td>Wierson, Myron B.</td>
<td>Ames</td>
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<td>Winslow, John S.</td>
<td>Fort Dodge</td>
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<td>Wright, Richard L.</td>
<td>Sioux City</td>
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_Nineteen Forty-three_
AN UNUSUAL and perhaps different year, but the foresters have been right in there as always. Old and new activities have been undertaken and put over much the same as in other years but this year the keynote has been to complete all lagging projects and in general leave things in good shape for the fellas coming back and for these tender youths who have not as yet worried about mensuration or management.

With the opening of school last fall there was the customary greeting of "Understand you had a paid vacation this summer Bub" or "Pretty poor country you guys held camp in, what did you use for timber?" Long argument and debate followed along the lines of kinks in the back from work and the beauty and splendor of Black Hills' ponderosa pine. Some fellas who stayed on last spring for summer school could not say much except for an occasional reference to the hardships of the summer of '41.

Within a week the Forestry Club took over under the able direction of President Carl Mayer. George Hartman, Jr., secretary; George Thomson, vice-president, and Bill Chilcote, treasurer, were right with Mayer on running the organization as well as the cabinet of McDermott, senior representative; Skvaril, junior representative, and Breckenridge, sophomore representative.

One of the first considerations was to get moving on completion of the cruising of the Holst tract. This tract was given in complete jurisdiction to the Forestry Club by the State. For three years a lot of theories and ideas were expounded with little accomplished in the way of actual field work. This fall, however, an excellent turn-out on the part of the fellas saw a great deal of cruising and mapping cleaned up.
The Fall Campfire was a "lulu." The gang really turned out to drag firewood, play football, eat, sing, and listen to an excellent campfire program. Guests of the evening included our faculty, Doc Aikman, and Prof. Jack Dodds. Highlight of the evening was attempted creek jumping, at which a few of us were not too sharp.

Fall quarter came to a close much too soon. A lot of the old departmental standbys graduated and many of the younger men went to various branches of the service. These men, in many cases, found that the experience and knowledge gained in seemingly irrelevant courses of the past, was in sudden high demand by the armed forces.

Winter quarter started off in the usual uproar that marks the Hoedown. This year’s Hoedown goes down in the books as one of the best. Marlowe Burgy was the big instigator in charge of the whole business. Again George Thomson was there to do a polished job of decorating the Country Club. The theme this year was "A War-Time Logging Camp" and was emphasized by posted government pluggers urging the need for the production of more lumber, combined with a pine thinnings background. That the Hoedown was in demand was borne out by the fact that 150 tickets were put on closed sale to the foresters on Tuesday, and by Thursday six of them had to be called back so that there could be a general sale.

Looking ahead a little now, it looks like the game banquet of the last week of February may have as game "Iowa Buffalo" or maybe just toast and cheese. Transportation and cold storage locker shortages are problems still to be solved.

Individual laurels for the year by way of service to the department in general, are certainly due to George Thomson. George has been one of the boys behind the scene who make or break the success of an organization. He started the year by handling the food at the fall campfire. He is Art Editor of the Forester, and was also the Hoedown decorations committee chairman. George was given the responsibility of formulating a letter of congratulation and pride to Lyle F. Watts, Chief of the Forest Service, and did a job that goes on permanent file.

The Forestry Department may have to swing over to applied home economics next year as from all appearances male students will be at a premium. Professor Genaux is working on an outline of a course in "buttonhole working" catalog number 1063-A-1x². Professor Hartman is contemplating the feasibility of creosoting toll house cookies to withstand termite infestation. It would be a pleasure indeed to hear Professor
Goodspeed start a lecture with "Now girls" instead of "Gentlemen, at 1:05 1/2 P.M. on April 3, 1581 . . .".

The pearl of wisdom for 1943 is, remember men that with one exception Iowa State and Yale are the American schools that have furnished Chiefs of the United States Forest Service.

Upper left: Horse-play and bright lights; the phase on the bar-room floor; Burgy and the burlapped beauty; Center: Heavy work at the Holst Tract. Lower left: Kreimeyer and the San Antonio rose; Noon shade-up for the cruisers; The Marine Reserve and a Chi O.

Nineteen Forty-three
WE WERE finally going to find out for ourselves what summer camp was like. We had heard stories about it from the older boys but we didn’t know just how much to believe.

Everyone had to find his own way to the Black Hills camp. Some hitch-hiked, some came by car or train, but we all got there. Four good foresters were bringing the camp equipment in the G.M.C. and the old Dodge, and as they pulled into camp and skidded to a stop, we all jumped aboard and helped unload the boxes and trunks. The younger boys did most of the work because they wanted to get familiar with the tools we were going to use. Some were so eager to learn that they missed the first camp meal and when one of them was discovered later in the tool shed, he was standing along the south way and repeating the names of tools in order to memorize them. He had them all in a row and he knew most of them except the axe and the shovel. He always got those two mixed up.

Oscar got Gurk’s number the first day of camp. Gurk was sent into the mess hall to do K.P. so he started flirting with Mrs. Oscar. He really thought he was doing right though, because he figured that K.P. meant “kiss people.” He was punished by being fed peanut butter sandwiches every noon for the duration of camp.

Our camp work was usually finished by the middle of the afternoon and then everyone could do as he pleased. Most of the boys went to sleep. Sims paid one of the fellows five cents every half hour to ring the bell (an old circular saw blade). When the bell rang, Sims buried himself further in the covers and just ignored it. He said it made him feel good to lay in bed while the bell rang.
One fine day to remember is the one in which we visited Wind Cave, the buffalo herd and Evans’ Plunge in Hot Springs. All the boys went swimming and everyone had a swell time.

Some of the nicer boys (those that wouldn’t go into the bad town of Custer) were getting pretty long hair because they failed to visit the barber. So Chopper John and A. B. Thorpe decided to give each other a hair cut. The only barber tool was an old scissor found in the machine shed. It had been used previously to cut patching for inner tubes and also for bobbing horses’ tails. They sharpened it by rubbing it on the staves of our cots. Thus it was that terms such as “egg head,” “naked noggin,” and “crooked cranium” came into use. Chopper finally got professional and charged a dime a clip. Sometimes you could bribe him with a report, or an extra sandwich.

Weekends were always welcome. Some fellows went to Custer, some to other towns, some to a lake to fish and some just stayed home. Many a good forester went to his doom as he followed the crowd through the swinging doors of “Blacky’s,” or “Bucket of Blood,” for short. They were never the same after being there once. They were the culprits who introduced the game of poker into camp.

One beautiful night in July was what everyone termed as “a swell night for snipe.” Forty-one fellows in camp distinctly heard the snipe calling each other and after a few minutes the forty-second member said he thought he caught the sound too. Most of the fellows thought it would be a good idea to have a snipe breakfast the next morning. Everyone liked snipe drumsticks excepting the one fellow who’d never tasted them, but he was certainly willing to go help hunt them. After the art of snipe hunting was thoroughly described to him, he couldn’t contain his joy and he uttered high emotional squeals of happiness at the thought of such a pleasant adventure. Let’s call this guy Pud. It happened that Pud was the only man in camp that was lucky enough to own a gunny sack. He also got out a beautiful club he had carved from a pine branch and was saving to throw at marmots. Of course everyone had a flashlight and being armed in this manner, we started our hunting trip.

Pud was having a wonderful time picking up pointers on his job as chief snipe killer. Of course he had the honor of holding the sack first and no one could relieve him of his job. He promised to pass the sack to someone else after he had gotten ten snipes. After a very long hike, an ideal snipe hangout was located. Then Pud began his job of blinking the light eight times every five minutes. The rest of the fellows left to round

*Nineteen Forty-three*
up the snipe. Last we saw was eight winks of a flashlight through the trees.

Next morning when Pud ambled back to camp and saw all the fellows already there, he simply said, “Shucks, you guys ain’t got enough patience. I almost caught a bunch myself ‘cause I heard them just a little ways from where I was.” He stuffed his laundry bag back in his gunny sack, wiped the dirt off his club and hoped for a more favorable night to hunt again.

Some of our sightseeing trips took us to the Rushmore Memorial, the Federal Fish Hatchery at Spearfish, and the Homestake Gold Mine at Lead. The Fourth of July was spent at Devil’s Tower in Wyoming. We visited several large sawmills and they probably were the first that most of us had ever seen.

Everyone in camp enjoyed forest fires and we all had fun going to the two minor fires in our vicinity. Due to the shortage of manpower, however, the entire camp was subject to fire call at any time and a full set of fire tools was kept at camp.

The Forest Service cooperated wonderfully with our professors in showing us around the Hills. With them we visited camp and picnic areas, marked timber, visited burns, went to fires, and practiced fire line construction. They talked to us about forest management and silviculture. They showed us how to thin out trees. They went with us to the top of the Harney Peak Lookout Tower and to the bottom of the valleys to study grazing conditions. They were swell fellows and two or three of them were Iowa State College graduates.

Everyone enjoyed camp. There were minor gripes but everyone has forgotten them by now and thinks only of the happy times we had together. When the words “next Tuesday” meant the end of camp, the boys said it jovially but they really hated to leave the old barracks and Camp Custer. It had been a place where we had grown to really know each other. We didn’t know before camp what good sports our profs really were.

Besides the many souvenirs such as snapshots, deer antlers, porcupine quills, etc., taken home from camp, there were the pleasant thoughts of friends and fellowship in the minds of every forester. Those are the things we’ll remember when we’re a long way from home. They’ll make us want to get together again, and sing songs and tell jokes, and, what’s more, we’re going to do it, too.

We’re going to sing that song, “O, I’m a Hayseed,” the one that originated in our camp. We’re going to tell jokes about Prof. Mac and Prof. Goodspeed. The fellows that were from
California and New York, as well as the Louisiana boys, are going to be there. We'll have another camp fire in the woods, just like we did in camp, but we won't be eating peanut butter sandwiches.

_Nineteen Forty-three_
McDermott, Kuhns, Hill, Porter, Mendelson, Ellis
Adrian, Foa, Kucera, Obye, Burgy
Fisher, Thomson, Chilcote, Skvaril, Buck
1943
AMES FORESTER
STAFF

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Art Editor . . . . . . . . . . George Thomson
Assistant Editor . . . . . . Robert McDermott
Assistant Art Editor . . . . Paul Kuhns
Alumni Editor . . . . . . . . Clair Kucera
Assistant Alumni Editor . . . Tom Van Alyea

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Francis Colbert Joe Ellis
Ralph Dewey Herb Mendelson

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Advertising Manager . . . . . George Porter
Assistant Advertising Manager . . Marlowe Burgy
Circulation Manager . . . . . . Warren Doolittle

CONTRIBUTORS

Phil Buck Roy Fisher
Wendell Hill Ken Obye

Faculty Advisor . . . . . . . Prof. G. B. Hartman

Nineteen Forty-three 115
HELL
AND
HIGH TIMBER

Fire is a good servant
But a bad master
Be you observant
Against disaster.

Nineteen Forty-three
Wide is the gate
And broad is the way
Fire in the Heavens, and fire along the hills
A FOREST BEFORE FIRE

I

How like a church, cool, dim and still,
A forest stretching hill to hill—
No living man as old as these
Conifers, with centuries
Ringed within their bark, and all
Straight as spars, and heaven tall.
At their bases, ferns grow lush;
In their crowns, thrush calls to thrush.
Fragrant flowers spice the air;
Brooks sing carols; soft eyes stare
From a thicket, where a fawn
Is glimpsed, then like a dream, is gone.

—Ethel Romig Fuller

Ames Forester
A FOREST AFTER FIRE

II

How like some inferno, dire
With foreboding, after fire
Rampages up and down the aisles,
Leaving beauty waste for miles;
Leaving beauty without seed
Against a future time of need.

Mute, the songs in throats of brooks;
Smouldering ashes fill the nooks
Loved by ferns. The fawn lies dead;
No thrush calls from overhead;
And slowly all the now charred hosts,
Which once were green trees, turn to ghosts

—Ethel Romig Fuller
IN MEMORIAM

To you, Our Gallant Dead,
who lost your lives in war
that a peace worth living
might be won.

PATTERSON, ARTHUR K. '39 Army Air Corps
RICE, JAMES S. '41 Army Air Corps
SHIRK, REX Ex. '41 Army Air Corps
ERWIN, CLIFF '41 Army Air Corps
YOUNGGREN, PAUL R. '40 Army Air Corps

Nineteen Forty-three
AFIELD WITH THE FORESTERS
B. B. Bebensee, '40—I get to see Lt. Harold Swanson ('41) down here occasionally. I understand he is contemplating matrimony.

Howard R. Beguelin, '42—I am a topographic and geodetic computer and will graduate in February from the Engineers Specialist School in Lexington, Kentucky.

Jan Van Winkle Blount, '39—At present I am waiting out transportation to the South Pacific.

Capt. R. W. Busching, '40—Mail my "Ames Forester" to my wife—as God only knows where I'll be when they come off the press.

Ed Clarke, '42—Have been here two weeks of a two months course—from here I go to St. Mary's Pre-Flight School in California.

Cpl. R. J. Cowles, Ex. '44—I sold the old lady for $80. Not bad, eh, Mac, after all that way—

N. G. Glesne, '40—At present I am broke as the former $20 private, because I couldn't fly properly—I am studying to be a navigator.

John W. Heggen, '42—I'm in training at Abbott Hall, Northwestern U., but will be through here when the "Forester" is issued.

Donald J. Hodges, '35—Transferred to the guayule rubber project and am stationed in Salinas as nurseryman there.

Gerold W. Kruse, '31—Employed on camouflage by the U. S. Corps of Engineers in the Middle Atlantic Division.

Cpl. John W. Kulp, '29—Wed Miss Carol Muenzer of Rush City, Minn., last April 11; inducted into army on July 8.

J. Donovan Larson, '41—From the U. S. Soil Conservation Service to Selective Service—and back again soon, I hope.

J. M. Larson, Ex. '41—Trying to keep a wife and baby girl on $66 a month is a pretty tough proposition—will be commissioned in 5 months.

Lt. Virgil W. Matlack, '38—In Post Headquarters at Ft. Riley, as Assistant Director Personnel Division.

A. A. McCutchen, '29—Transferred from Fort Collins, Colo., to Custer Forest at Billings, Montana, and we like our assignment very much.

Karl E. Moessner, '30—Assigned to Ft. Snelling; in case any bombs hit Iowa State, let me know.

Ronald Moss, '43—I am in the hospital corps of the U. S. Navy. I was very sorry to learn that Prof. Goodspeed broke some ribs while chasing rattlesnakes at summer camp. Tsk! Tsk!

D. F. (Jack) Newville, '34—I have become the father of a daughter, Pat, who, my wife informs me, takes after her old man.

Dale C. Olsen, '42—The work here at this midshipmen's school is being thrown at us hard and fast—will have a midshipman's commission by Christmas (42).

George J. Pecaro, '30—Since I have been unable to get back to Ames to see Ames foresters, I did the next best thing and brought a group of Ames foresters to work with me.

William Rice, '42—If anyone of you fellows come to Minneapolis and fail to see either Bob Boatman or I, we will consider it a personal insult.

Robert S. Rummell, '42—Inspector of wood with the Army Air Force; and forestry surely has stood me in good stead for the job at hand.

Sylvan T. Runkel, '30—Staff Sergeant, giving flight instruction to glider students of the U. S. Army Air Corps.

Charles J. Schissel, '42—Having any trouble keeping sailors from monopolizing I. S. C. coeds?

George G. Steig, '42—I'm running a separator station on the stock chain in the Long Bell mill here.

* Nineteen Forty-three *
Don L. Strong, Ex. '45—Enlisted in the U. S. Marine Corps and at present in training at San Diego, Calif.

C. Svendby, '26—Transferred to Region 6 of the S. C. S.—now as Chief of the Regional Forestry Division.

Charles M. Swanson, '38—From forestry to war in two easy lessons; mainly Air Intelligence Schools.

Clifford O. Swanson, '38—May God speed our victory, so we all can go back to a home which will have survived this war.

Charles T. Tustison, '34—Have been away from forestry since September of 1940, having been in the army since then.

John R. Wilson, '38—Hugo B. Werner, '37—Have been running a lot of box shooks through the plant during the last year.

ALUMNI DIRECTORY

1900
Mast, Wm. H., Nurseryman, 3800 Brady St., Davenport, Iowa.

1904

1907

1908

1909
Allen, Shirley, Professor of Forestry, Univ. of Michigan, Ann Arbor, Michigan.

1911

1912
Lessel, L. R., Forest Supervisor, U. S. F. S., Silver City, New Mexico. O’Banion, A. C., County Agent, Park Rapids, Minnesota.
Richmond, H. H., Timber Mercantile Business, Cass Lake, Minnesota.
Smith, Wm. A., Los Angeles County Supervisor, Hall of Records, Los Angeles, California.
Truax, T. R., Principal Wood Technologist, Forest Products Laboratory, Madison, Wisconsin.

1913

Baxter, L. J., Farming, Galva, Iowa.
Clark, Hal B., Foreman, Iowa Ordnance Plant, 603 Sumner St., Burlington, Iowa.
Hensel, R. L., In Charge Range and Pasture Investigation, College Station, Texas.
Ringheim, H. I., Superintendent, Monarch Lumber Co., Ltd., Saskatoon, Canada.
Watts, Lyle F., Chief Forester, U. S. F. S., Washington, D. C.

1914

Hassel, W. C., Penick and Ford, Ltd., Inc., 1158 J Ave. N. W., Cedar Rapids, Iowa.
Hayes, Ralph W., Head, Forestry Dept., Baton Rouge, Louisiana.
Nagel, William M., Assistant Regional Forester, U. S. F. S., Missoula, Montana.
Sterrett, John C., Real Estate, 701 West St. Charles Road, Elmhurst, Illinois.
Wolven, R. M., Kenyon and Wolven Motor Service, 333 E. Bishop, Santa Ana, California.

1915

Bode, I. T., Director of Conservation, Cons. Com., Jefferson City, Missouri.
Hansel, H. E., County Highway Engineer, Court House, Ottumwa, Iowa.
Harley, William P., President J. C. Baldridge Co., 1506 Park Ave., Albuquerque, New Mexico.

1916

Cornell, Harvey H., Regional Chief Planning, National Park Service, Santa Fe, New Mexico.
Geilsler, Max, 5240 Sheridan Road, Chicago, Illinois.
McCarthy, C. C., City Manager, Webster City, Iowa.
Rumbaugh, W. R., Farming, Collins, Iowa.

1917

Hartman, George B., Associate Professor Forestry, Ames, Iowa.
Henry, A. S., Bell Telephone Co., Des Moines, Iowa.
Quint, J. H., Dentist, 143 N. Brand, Glendale, California.

1918

Davis, E. M., Senior Wood Technologist, Forest Products Laboratory, Madison, Wisconsin.

Nineteen Forty-three
Donahoo, John F., Warehouse Clerk, Camp Roberts, California.
Hadlock, Frank D., Engineer, Western Electric, Kearny, New Jersey.
Rehmann, Theodor W., Vice-President Hawkeye Co., 206 Flynn Bldg., Des Moines, Iowa.

1920

Baker, C. J., Teaching, 5308 Clinton Ave., Minneapolis, Minnesota.
Deming, Milo H., Range Examiner, 206 8th Ave., Salt Lake City, Utah.
Fletcher, R. A., Insurance, 10 Murdock Court, Oakland, California.
Hoyer, V. B., Central St. For. Exp. Sta., Columbus, Ohio.
Loy, Elmer C., Project Conservation SCS., Kalispel, Montana.
Poshusta, D. C., Field Director, American Red Cross, A. P. O. 811; c/o P. M., New York, New York.

1921

Cormany, C. P., Lumber Salesman, 201 N. Wells St., Chicago, Illinois.
Helm, Harley J., Chief, Regional Range Conservation Division, 2223 Fulton St., Berkeley, California.
Ling, Wen Ming, Library, Univ. Nanking, Chingtu, Szechuen, China.

1922

Buck, K. J., 418 South 38th Ave., Apt. 31, Omaha, Nebraska.
Eggers, Wm. C., Sales Rep., Long-Bell Lumber Co., 404 Warden Bldg., Fort Dodge, Iowa.
Fennell, Robert E., Agent, Prudential Insurance Co., 1305 Merchants Block, Indianapolis, Indiana.
Meravets, F. L., Associate Forester, 424 U. S. Court House, Portland, Oregon.
Morris, Roger D., Forester, Land Use Planning, Box 1310, Albuquerque, New Mexico.
Pohle, Edwin, Manager, Southern Lumber Co., 1402 S. First, San Jose, California.

1923

Bogen, A. J., 10047 Mark Twain Ave., Detroit, Michigan.
Dunn, Paul M., Dean, School of Forestry, State College, Corvallis, Oregon.
Palmer, Hellis S., Assistant Range Examiner, P. O. Box 2260, Phoenix, Arizona.
Trenk, Fred B., Extension Forester, College of Agriculture, Madison, Wisconsin.

1924

Martin, Chester W., Field Agent, Com. on Forests and Wildlife, State Office Bldg., Hartford, Connecticut.
Miller, Allen F., 1108 So. Elizabeth, St. Louis, Missouri.
Rutter, Frank J., 2456 Estes Ave., Chicago, Illinois.

1925


Ames Forester
Durrell, Glenn R., Director, Division of Forestry, Capitol Office Bldg., Oklahoma City, Oklahoma.
Lough, Wm. E., 5641 Cerritos Ave., Long Beach, California.
Towne, C. R., Forester, Dept. of Agriculture, P. O. Bldg. Durango, Colorado.

1926
Barnoske, Francis M., Salesman, Wheeler Lumber Co., Box 391, Hastings, Nebraska.
Greef, Chas. H., Salesman, Curtis Co., 2035 Houston Place, Denton, Texas.
Kouba, T. H., Bureau of Entomology, Room 422 North, State Capitol, Madison, Wisconsin.
McIntire, G. S., Assistant State Forester, Dept. of Cons., Lansing, Michigan.
Schulze, Nathan C., 375½ N. Martello Ave., Pasadena, California.
Svendby, Clarence, Chief, Regional Forestry Division, 3700 Mesa Verde Drive, Albuquerque, New Mexico.
Tharp, Orlo E., Farmer, Bellefontaine, Ohio.
Walling, Chester, Ridgeview Hotel, 901 Maple, Evanston, Illinois.

1927
Fullerton, Neil, St. Maries, Idaho (U. S. Army).
Hutchings, Gordon C., Rainbow Trout Farm, Route 1, Henderson, Colorado.
Jackson, M. D., City Engineer, 620 Clark St., Stevens Point, Wisconsin.
McLaren, C. G., Woods Supt. and Board of Directors, Tomahawk Kraft Paper Co., Tomahawk, Wisconsin.
Rindt, Charles A., 7510 Reed College Place, Portland, Oregon.
Wiggins, A. V., Story City, Iowa.

1928
Armstrong, George W., Recreation Assistant, U. S. F. S., P. O. Bldg., Los Angeles, California.

Nineteen Forty-three 131
Ball, Donald R., U.S.F.S., 302 Minneapolis Ave., Duluth, Minnesota.
Battell, Samuel M., Collins Timber Co., 914 2nd St., Natchitoches, Louisiana.
Iverson, R. C., 919 B Arbutes, Rhinelander, Wisconsin.
Hill, Edwin, SCS, 1230 Arthur St., Wausau, Wisconsin.
Lester, Orville, Farming, Indianola, Iowa.
Lundberg, Reuben, 2040 Oak, Paso Robles, California.
Peters, George J., Mulberry St., Montoursville, Pennsylvania.
Sonner, Orville, Farming, Hamburg, Iowa.
Wicks, Walter, 409 E. 29th St., Sioux Falls, South Dakota.

1929

Beveridge, W. M., Asst. For. Sup., U. S. F. S., Alamagordo, New Mexico.
Chapman, A. G., Chief, Div. of Forest Mgt., Central States For. Exp. Station, 90 W. 10th Ave., Columbus, Ohio.
Christensen, L. L., Assoc. Soil Cons., S. C. S., Bedford, Iowa.
Holding, A. L., SCS, 620 W. Main, Council Grove, Kansas.
McCutchen, A. A., Supervisor, Custer Forest, Billings, Montana.
Morey, Harold, U. S. F. S., Washington, D. C.
Olson, Roy W., Asst. For. Supervisor, U. S. F. S., St. Louis, Missouri.
Scholz, Harold F., Silviculturist, Univ. of Minn., St. Paul, Minnesota.

1930

Burkett, Luther B., Assistant Forester, U. S. F. S., Bedford, Indiana.
Hawkins, V. T., 809 Main St., Trenton, Missouri.
Holtz, Robert D., Supt. Mescalero Indian Agency, Mescalero, New Mexico.
Mickey, M. H., Jr., Farm Forester, SCS, Carsons, Kansas.
Moessner, Karl E., 300 Black Hawk Rd., Waterloo, Iowa (Field Artillery U. S. Army.)
Nichols, Floyd A., Forest Ranger, U. S. F. S., Cloudcroft, New Mexico.
Pecaro, George J., Flintcote Co., Meridian, Mississippi.
Runkel, Sylvan T., Story City, Iowa (Glider Flying, Air Corps).
Marriage, Lester, Popejoy, Iowa.
Smith, Maynard, Smith Cottages, Okoboji, Iowa.
Soderberg, Gordon, Lumber and Coal Company, Mead, Nebraska.
Stoughten, Margaret (Mrs. Abell), 1060 Cragmont Ave., Berkeley, California.
Wambold, Lloyd D., Co. Forester, Diamond Match Co., Stirling City, California.

1931

Benson, Ellsworth, Rehabilitation Supt., 755 21st Ave., Columbus, Nebraska.
Brands, Andrew, White Sulphur Springs, West Virginia.
Griswold, G. H., District Forest Ranger, U. S. F. S., Marion, North Carolina.
Ilch, David M., 515 E. Orange, Santa Maria, California.
Lubberts, D. R., Farming, Waterloo, Nebraska.
McCormick, Leighton E., State Exp. For., 201 Whitten Hall., Univ. of Missouri, Columbia, Missouri.
Moser, Harold C., Forest Econ., Univ. Farm, St. Paul, Minnesota.
Priester, F. T., Avoca, Iowa.
Roche, Lloyd J., Gallatin, Missouri.
Smith, Clyde T., Dist. Forester, 240 15th St. N., Wisconsin Rapids, Wisconsin.
Thielking, Karl F., Assoc. Forester, S. C. S., 912 Connelly St., Clovis, New Mexico.
Unser, George M., Walsh Construction Co., Camp El Mamo, A. P. O. 803, Port of Spain, Trinidad, B. W. I.
Ziebarth, Robert K., Farm Forester, SCS, Ronceverte, West Virginia.

1932

Dyksterhuis, E. J., 5344 Leighton, Lincoln, Nebraska.
Giffen, Wm. D., Elizabethtown, Illinois.
Hinkley, Harry S., Area Tech., S. C. S., Chico, California.
Kline, George, Creameryman, Lone Tree, Iowa.
Potter, E. D., Retail Florist, Box 385, Clinton, Iowa.
Schafer, Arthur, U. S. F. S., Munising, Michigan
Swanson, Lt. Charles M., 1621 23rd St., Sioux City, Iowa.

1933


Nineteen Forty-three
Gibson, L. M., Chemist, Flambeau Paper Co., Park Falls, Wisconsin.
Hart, E. D., Enoch Pratt Library, 3614 Ruxmere Road, Baltimore, Md.
Hendrickson, Einar L., Asst. For. TVA, Norris, Tenn.
Olson, E. F., Asst. For. TVA, Norris, Tenn.
Ponomareff, Nicholas, Consulting Pathologist, P. O. Box 369, Tucson, Arizona.
Sack, Ivan, Sac City, Iowa (U. S. Army)
Steavenson, H. A., Nursery Manager, SCS, Elsberry, Missouri.
Stone, W. E., Forester, Masonite Corp., Laurel, Miss.

1934

Bateman, Bryant A., Asst. Prof. Forestry, Louisiana State, Baton Rouge, La.
Battell, Frederic, Lib. Asst. College of the City of N. Y., 139th St. & Convent Ave., New York, N. Y.
Campbell, Samuel, Farmer, R. R., Eldora, Iowa.
Chisholm, L. W., Asst. For., U. S. Indian Service, Cass Lake, Minn.
Dorman, Keith W., Cons. Aide, U. S. F. S., Brooklyn, Miss.
Hatch, Wm. L., 1300-32nd St., Des Moines, Iowa (U. S. Army)
Hess, Robert W., Research, Curtiss-Wright Corp., 61 Ayer Road, Williamsville, New ersey.
Hubbard, John., Draftsman, Chas. T. Main Co., Inc., Kingsport, Tenn.
Johnson, O. M., Cons. Aide, U. S. F. S., Poplar Bluff, Mo.
Lehman, Arthur, 321 Monroe Street, St. Charles, Mo.
Richman, H. W., Asst. For. Central States For. Exp. Sta., Columbus, Ohio
Schreeder, G. M., Conservationist, SCS, Keosauqua, Iowa.
Suder, Robt. G., Junior Soil Cons., SCS, Albion, Nebraska.
Tustison, Chas. H., Yates Center, Kansas (U. S. Army, F. A.).

1935

Beyer, Jack, Sec., Queal Lbr. Co., 600 7th St., Des Moines, Iowa.
Campbell, Richard B., Central States For. Exp. Sta., Columbus, Ohio.
Christensen, John I., Senior Grader, N. E. Timber Salvage Adm., 32 Wilder St., Nashua, New Hampshire.
Curtis, Robert L., Ext. For., Univ. of Mo., Columbia, Mo.
Harvey, Ralph R., Jr. Soil Cons., SCS, Winterset, Iowa.
Hodges, Donald J., Nurseryman, Guayule Rubber Proj., 39 Myrtle Court, Salinas, Calif.
Hutchinson, Robert, Senior Eng., War Dept., R. 4, Box 9, Sparta, Wisconsin.


Muller, Paul M., (Address uncertain).

Olson, Oliver, c/o Ben I. Kramer, Shirley, Mo., (U. S. Army).


Thomas, Gall M., State Coordinator, Federal Aid to Wildlife, Game and Fish Comm., Cheyenne, Wyoming.


Wiley, Harold E., Farming, Center Point, Iowa.

1936

Ball, Glenn, Dept. Supt., Flintkote Company, 2301 12th St., Meridian, Miss.


Brinkman, Kenneth A., 3316 West St., Ames, Iowa (U. S. Coast Guard).

Carlson, Henning, Jr. For., SCS, 628 Edison St., Geneva, Ill.


Cox, Darold E., Dist. Ranger, Heise, Idaho.


Ellerhoff, Manford A., Farm For., SCS, P. O. Bldg., Waukon, Iowa.


Felker, Ralph H., Asst. For., SCS, Price, Utah.

Ferguson, Lewis K., Algona, Iowa (U. S. Army, Q. M. Corps).

Getty, Russell E., c/o Rev. A. W. Schlesselman, Merrill, Iowa (U. S. Navy).


Johnson, Glen L., Gen. Supt., Prairie States Forestry Proj., City Hall, Mitchell, S. Dakota.


Jule, W. Leroy, Lumber Grader, Bowman Hicks Lumber Co., Wallowa, Oregon.


McElhinney, Gail, Forester, Gaylord Container Co., Bogalusa, Louisiana.

Millus, Hans C., U. S. F. S., Bend, Oregon.

Nissen, Paul Frank, Real Estate Salesman, 209 Sec. Bldg., Cedar Rapids, Iowa.


Renaud, Jules, Dist. Soil Cons., SCS, Box V, Panguitch, Utah.

Thayer, Marshall, State Game Dept., Park View, New Mexico.

Tribbett, Vance A., 149 Willow St., Brooklyn, New York (U. S. Navy).

Wiehn, J. Leonard, Chief Clerk, Dupont Co., 1608 E. 24th St., Cleveland, Ohio.

1937

Parton, James H., 2123 Jennings St., Sioux City, Iowa (U. S. Army, Cavalry).

Nineteen Forty-three
Baugham, Robert, R. 3, Ames, Iowa.
Bradford, Morse V., 1109 Blvd., Shreveport, Louisiana (Address uncertain).
Cook, H. C. Freeman, 6225 Powhatan Ave., Norfolk, Virginia.
Cornwell, Wm. G., U. S. Census Bureau, U. S. P. O., 2524 17th St. N. W.,
Washington, D. C.
Dannenberg, Walter W., Wood Camp Supt. U. S. Gypsum Co., Green-
ville, Mississippi.
David, Donald E., Queal Lbr. Co., 224 E. Grand, Des Moines, Iowa.
DeYoung, C., State Materials Inspector, Highway Commission, Ottumwa,
Iowa.
Ehrenhard, Clayton Coen, Bowman Hicks Lbr. Co., Wallowa, Oregon.
Follen, W. P., Tie & Timber Inspector, Box 391, Valdosta, Georgia.
Holscher, Clark E., Asst. Range Examiner, NRM Forest-Range Exp. Sta.,
Missoula, Montana.
Kinkor, Clarence C., Asst. Soil Cons., U. S. Indian Service, Sells, Ari-
izona.
O'Neill, Gordon K., 134 Campus Ave., Ames, Iowa.
Overby, James F., R. 2, Dubuque, Iowa (U. S. Army, Field Artillery).
Patterson, Archie E., Asst. Prof., Univ. of Ga., Sch. of Forestry, Athens,
Georgia.
Saddoris, Thomas J., Jordan, Iowa (U. S. Army, Engineers).
Seeman, Louis N. A., For. & Woods Supt., Wyatt Lbr. Co., Gandy,
Louisiana.
Smith, Harlie M., SCS, 80 So. Stone Ave., Tucson, Arizona.
Stone, Frederick M., Omro, Wisconsin.
Stump, Wm. G., Farm Forester, Elkader, Iowa.
Hill St., Dubuque, Iowa.
Werner, Hugo B., Boone Forest Products, P. O. Box 525, Boone, Iowa.
Wilhelm, George, Veneer Salesman, R. S. Bacon Veneer Co., 218 Palmer
St., Jamestown, New York.

1938

Baker, Richard C., Construction Clerk, Reinforcing Steel Dept. Plant
No. 2, Alabama Ordnance Works, Childersburg, Alabama.
Baird, Clarence L., Ranch Planner, SCS, Box 256, Julian, California.
Beyer, Francis H., SCS, 619 E. McHarg St., Stamford, Texas.
Blackman, Samuel Rees, Parsons, West Virginia (U. S. Army).
Cummings, Royal, Aviation Mechanic, Northampton, Massachusetts.
Dykstra, S. P., Resident Sales Mgr., S. W. Lumber Mills, Inc., McNary,
Arizona.
Felton, Lawrence, 317 Berwyn Ave., Trenton, New Jersey (U. S. Army,
Q. M. Corps).
Ferguson, John G., Panama Canal Zone, Exp. Garden, Margarita, Can-
al Zone.
Gustine, Clarence S., Production Eng., Evans Products Co., 356 Vine St.,
Lebanon, Oregon.
Harbour, Ray R., What Cheer, Iowa.
Harrington, Douglas G., Jr. Range Exam., U. S. Indian Service, Tuba City,
Arizona.
Hohenadel, Sam. F., 416 W. 3rd St., Muscatine, Iowa (Address not cer-
tain).

Ames Forester
Hotchkiss, J. D., C. M. St. P. C. P. R. R., Decorah, Iowa.
Hughes, Ralph H., R. 4, Boone, Iowa (U. S. Army, Engineers).
Huntington, Seth M., 723 Kansas City St. Rapid City, South Dakota.
Joranson, Philip N., 22 Hillside St., Advanced Studies, San Anselmo, California.
Kellstedt, Paul A., Dupont Co., 540 N. 11th St., Muskogee, Oklahoma.
Kennedy, W. B., Ida Grove, Iowa (U. S. Navy).
Larson, Merlin Devere, Swea City, Iowa (U. S. Army Air Force).
McLintock, Thos. F., Central States For. Exp. Sta., 90 W. 10th Ave., Columbus, Ohio.
Matlack, Virgil W., Ames, Iowa (U. S. Army, A. G. D.)
Miller, Homer E., Ida Grove, Iowa (U. S. Army, Field Artillery).
Mullen, Franklin H., Timber Marker, Houghton & Mckay, Gastonburg, Alabama.
Peterson, Ansel, Anita, Iowa (U. S. Army, Eng.)
Phillips, Raymond, Farm Forester, Box 654, Dubuque, Iowa.
Sauer, Kenneth W., Quality Supervisor, Flintkote Co., 2312 35th Ave., Meridian, Mississippi.
Schierbaum, D., Game Research Investigator, Fernow Hall, Ithaca, N. Y.
Schmidt, Ralph A., In Charge, Pittman Robertson Project 17, 308 Park Ave., Durango, Colorado.
Scoltock, Joseph D., Winton Lumber Co., 2600 Forshay Tower, Minne-
apolis, Minnesota.
Secor, James B., Iowa Geodetic Survey, Muscatine, Iowa.
Smith, Walter P., Forester, TVA, Norris, Tennessee.
Starr, John P., 5135 Shriver Ave., Des Moines, Iowa (Address uncertain). Swanson, Clifford O., Larrabee, Iowa (U. S. Army, Field Artillery).
Theophilus, David C., 720 Pearl St., Carroll Nebraska (U. S. Army).
Von Gillern, Robert, Niles Center, Illinois (U. S. Army Air Corps).
Wilsen, John Raymond, Boone Forest Products, Boone, Iowa.
Yoder, Ralph E., Dant & Russell Ltd., 1010 Washington St., Vancouver, Washington.

1939

Ayer, Darrell Pike, Forester, Homestake Mining Co., 113 E. J St., Spear- fish, South Dakota.
Babel, John Stanley, Albia, Iowa (U. S. Army Air Corps).
Bjork, Clayton, 1209 E. 7th St., Des Moines, Iowa (U. S. Army).
Bjornson, Harold B., Goldfield, Iowa (U. S. Coast Guard).
Blount, Jay V., 6004 Waterbury Circle, Des Moines, Iowa (U. S. Army Air Corps).
Chambers, Wayne R., Goodell, Iowa (U. S. Army, Engineers).
F. S., Ketchikan, Alaska.
Collister, Lauress C., Chemist, Treating Dept., the A. T. & S. F. Ry., care Manager Treating Plants, Topeka, Kansas.
Cook, Francis J., 104 12th St., LaPorte, Indiana.

Nineteen Forty-three 137
Cox, Royce, Timber Marker, Potlatch Forests, Inc., Headquarters, Idaho.
Engelking, Truman G., Arkadelphia, Arkansas (U. S. Army Air Corps).
Flick, Frances, Des Moines Public Library, Des Moines, Iowa.
Froelich, John L., Wesley, Iowa (U. S. Army, Q. M. Co.).
Grau, Robert B., Newell, Iowa (U. S. Army Air Corps).
Gunderson, Omer J., Salesman, Mason City Millwork Co., Mason City, Iowa.
Goldberg, Joe, 1806 E. 7th St., Sioux City, Iowa (U. S. Army, Infantry).
Haukom, Allan A., Cutler, Wisconsin (U. S. Marine Corps).
Hicks, Lyell E., Storm Lake, Iowa (U. S. Navy).
Hogelin, Milford C., Guthrie Center, Iowa (U. S. Navy).
Hoskins, Robert N., Extension Forester, P. R. Branch, Tallahassee, Florida.
Jamison, Glen M., Asst. Ag. Aide, SCS, Stanton, Texas.
Kindig, Earl R., Washington, Iowa (U. S. Army).
Lehmann, Karl T., 321 Monroe St., St. Charles, Missouri (U. S. Army, Engineers).
Phinney, Hartley K., Grad. Asst., Dept. of For. Botany, N. Y. College of Forestry, Syracuse, N. Y.
Scholtes, Wayne H., 648 6th Ave. S., Clinton, Iowa (U. S. Army Air Corps).
Schumacher, Charles M., Orleans, Nebraska (U. S. Marine Corps).
Smoke, Joe E., Shenandoah, Iowa (U. S. Army, Field Artillery).
Stiehl, James H., Charles City, Iowa (U. S. Army).

1940

Allen, John C., U.S.F.S., Box 126, Sierra Madre, California.
Applequist, Martin B., 319 Stutsman St., Council Bluffs, Iowa (U. S. Army).
Armstrong, Don, Brooklyn, Iowa (U. S. Army).
Bebensee, Bruce M., Asst. to Forester, Flintkote Co., Meridian, Mississipi.
Benda, Kenneth J., TVA, Box 309, Rogersville, Tennessee.
Bishop, Clinton G., Elkader, Iowa (U. S. Army, Cavalry).
Bjorge, Wilson, Wautoma, Wisconsin (U. S. Army Air Corps).
Borthing, Conrad O., Weyerhaeuser Timber Co., Camp 6, Beatty, Oregon.
Boswell, Martin, Roswell, New Mexico (U. S. Army Air Corps).

Ames Forester
Brown, Percy J. C., Hot Springs, Arkansas (U. S. Army Air Corps).
Busching, Richard W., c/o Orland Bailey, Elkader, Iowa (U. S. Army, Air Corps).
Clemens, John R., Galva, Iowa (U. S. Army Air Corps).
Countryman, Dayton, Kingsley, Iowa (U. S. Army Air Corps).
Cutler, Vern H., 717 N. Washington, Mason City, Iowa (U. S. Army, Quartermaster Corps).
Dean, Lauren W., 2250 Bever Ave., Cedar Rapids, Iowa.
DeFore, Robt. Chas., 1203 Douglas Ave., Ames, Iowa (U. S. Army Air Corps).
Derr, Harold J., Larchwood, Iowa (U. S. Army, Medical Corps).
Dorman, Merle L., California-Oregon Paper Mills, 6136a, Huntington Park, California.
DuBois, R. P., Plover, Iowa (U. S. Army Air Corps).
Dunck, Richard Louis, 1002 E. Main, Belleville, Illinois.
Ellison, Marlon, Woodbine, Iowa (U. S. Army, Field Artillery).
Fabre, Lester F., State Cons. Com., Box 212, Spirit Lake, Iowa.
Faraday, Wayne B., Clerical, Standard Oil Co., Box 571, Council Bluffs, Iowa.
Fisk, Carroll V., District Forester, Missouri St. Cons. Com., Box 113, Camdenton, Missouri.
Gillett, George W., Carroll, Iowa (U. S. Army Air Corps).
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Nineteen Forty-three 139
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1941

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1942
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