1924

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To Horace J. Andrews

Assistant Professor of Forestry 1921-1924, we, the foresters, respectfully dedicate this volume. As an instructor he was unexcelled. He knew his subjects, knew how to teach them, and knew when the student had all he could carry. His work with the Forestry Club can not be over estimated. He was a builder of club morale. If the club needed help from "Andy" they always got it, and at all the forester banquets he acted as toastmaster. No forester will ever forget a banquet at which "Andy" officiated. Michigan's gain is our loss.
Forestry in Massachusetts

Dewey Berckhan, Ex. '24

Perhaps no state in the Union has conditions so suitable for the application of scientific forestry or is doing more along forestry lines, than Massachusetts. Here there are no virgin forests. It is a problem of conservative handling of second growth material and the reclaiming of waste lands.

Forestry and the reclaiming of waste lands are usually associated together. Old abandoned farm lands, now entirely unfit for agricultural purposes, may be reforested and made to yield a profitable return in timber, and at the same time build up the soil. This sort of reclamation work may apply to more than one-half of the state of Massachusetts. Hundreds of rocky "run-down" farms have been abandoned throughout the state and it is the reclaiming of this land that the Conservation Department of the state has determinedly and actively set out to accomplish.

Historical

A brief history of the growth of the forestry program should be of interest. In 1908 a Reforestation Act was passed by the state, under which anyone having an area not exceeding 80 acres in size, might turn it over to the state at the appraised value. The state in turn reforested and administered it. Any time within 10 years after the land had been taken over the owner could redeem the area by paying to the state the initial cost of the land plus cost of planting and administration, with interest at 4%. After 10 years has elapsed the land is unredeemable and is retained by the state. One hundred and eighty-one lots have been turned over to the state in this way. Fifty percent of these areas have been redeemed, the remaining 50% have either reverted or have a few more years of grace. These areas have been taken over in all parts of the state and on all kinds of site conditions. The movement has met with great success and public satisfaction.

In 1914 an act was passed to purchase land for state forests. Five state forests were purchased ranging in size from 1,200 to 7,000 acres. These original five state forests were the Miles Standish State Forest in Carver, Harold Parker State Forest in Andover, Swan State Forest in Monterey, Savoy Forest at Savoy and Otter River State Forest at Winchenden.
Another act was passed in 1921 which authorized the Conservation Department to purchase 100,000 acres at a price not to exceed $5.00 per acre and to reforest the land as fast as it was secured. Three million dollars were set aside for the purchase and reforestation of the land and 15 years was given as a time limit to complete the project. Within these first three years, 50,000 acres were purchased.

In addition to the State Forests and the Reforestation Lots, there are numerous small reservations held by Trustees of Public Lands such as parks and recreational grounds. These vary in size from 75 to 200 acres, and are usually on high points or scenic spots of unusual value for recreation.

**Nurseries and Plantings**

Massachusetts also has three state nurseries, located at Amherst, Bridgewater and Barnstable. These nurseries furnish stock for the reforestation of state, city, town and private acreages. The stock on hand this year was approximately 20,000,000 seedlings, mostly conifers, as the work in hardwoods has not been carried on extensively as yet except with poplar cuttings. These have been started and in a few years
are expected to be set out on a State Reservation for pulpwood production. There are also sub-nurseries on each reservation in addition to the three main nurseries.

**Taxation**

The system of taxation on this area is of interest. The taxes remain constant for 5 years after the date of purchase. After this the State Tax Commissioner revalues the land. In this way the towns do not lose any tax money.

The latest tax law has encouraged the public to perpetuate the forests. Anyone having woodlots valued on the town tax list at $25.00 or less per acre and possesses not more than 20 cords per acre with potential promise of a minimum of 8,000 ft. Board Measure of hardwoods, 20,000 ft. Board Measure of conifers, or a proportionate amount per acre at maturity, may register this land at the Assessor's office. From registration time until the timber produces 10,000 ft. Board Measure of hardwoods, 25,000 ft. Board Measure of conifers or proportionate amounts per acre, the land is taxed for the value of the land. When, in the opinion of the Assessor, the timber has reached its prescribed limit, the owner is notified. Two years after this it is taken off the classified list and placed on the general property tax list, providing that the owner has not reduced the timber content. The owner may reduce the timber content at any time and keep it on the classified list. The owner may also have cordwood or lumber from his area for personal use to the value of $25.00 a year. If he cuts more than this he must pay a tax of 6% on the value of the timber cut.

When the Assessor notifies the owner that he is going to take the property off the classified list and place it on the open list, the owner may protest and refer the matter to the State Forester. The Forester decision is final.

**Extension Service**

In addition to caring for state property, the Department of Forestry is willing to make examinations for the public. These examinations may be timber estimates, advice on managing timbered areas, aid in controlling infection of disease, insects, etc. The only cost is the examiner's transportation charges. Between 65 and 70 such examinations are made yearly.

**Protection**

If the state forests are to be maintained at highest efficiency they must be protected from fire. In the last eleven years the fire loss in the state has been cut down 85%. Forty fire lookout towers are scattered over the state, located in
such a way that any point can be seen readily from two towers. Watchmen are on duty from daylight until dark during the fire season. The District Fire Wardens, of which there are seven, erect these towers and look after their upkeep. It is also the duties of these men to build telephone lines, look after the burning of slash, see that sawmills are equipped with spark arresters and see that the mill owners are operating according to state laws and regulations. The activities of these men are directed by the State Fire Warden and they in turn direct the Town Fire Wardens.

One of the outstanding fire protective measures is the new Slash Law which makes it necessary for mill operators to remove the slash on their operations at least 40 feet from the adjoining owners and 40 feet back from highways and railroads.

Insect control is also receiving its share of attention. In an effort to suppress the Gipsy and Browntail moth, a Superintendent has been appointed who superintends seven district moth men. Each town has a local superintendent who cooperates with these men and the U. S. Forest Service handles the outlying infested districts and does scout duty. The State furnishes arsenate of lead to the towns at cost. Each town has its own power sprayer and the State has additional machines. The spraying is done 200 feet on either side of the road and orchards and shade trees in the city parks are sprayed. To spray more than this would be prohibitive in cost. Calasome beetles and other parasites have been used to combat the moths.

Blister rust crews are also doing their part to protect the white pine. They destroy the wild currant and gooseberry bushes and thus stamp out the blister rust. The public has also been educated to the fact that wild currant and gooseberry bushes must go if they are to save the pines.

In conclusion, I want to pay tribute to the forestry work in this old state. Massachusetts is small, 150 miles east and west and 100 miles north and south. It is handling a big job in a very commendable manner. The future of the work will steadily move on towards a sustained annual yield policy and be an advanced guard in saving the East from the timber famine that is threatening.
How Research in Forest Products Affects the Practice of Forestry

By Arthur Koehler
In Charge of Office of Wood Technology, Forest Products Laboratory, Madison.

Address delivered at the meeting of the Intercollegiate Association of Forestry Clubs, Ames, Iowa, March 8, 1924.

A prominent professor in one of our large universities told his class that his ambition had been to become a philosopher for he loved to speculate on the abstract realities of life; but he soon found out that the philosopher has to go where the scientist pushes him, and so he decided to become a scientist and do some of the pushing.

Similarly, practical matters have to yield to the onslaught of scientific research. Often the yielding is slow, the old wagon doesn't quite fit the gauge of the new road, but eventually the gauge of the wagon is changed and the new order is better than the old.

Research in forest products still is in its teens and hasn't forced many issues on a reluctant public, but already the youngster is beginning to have influence on his environment. His efforts are felt from the value of the standing forest to the value of waste paper; from the mill where steel is made for saws to the factory where the glue is made for gluing up the final product, aye, from the type of furniture in our homes and offices to the golf shaft used on Saturday afternoon to relieve the nervous strain of a cosmopolitan week.

The effect of research on the utilization of forest products is in itself no small story, but this paper will be confined to how more knowledge of the possibilities and limitations of forest products may affect the growing of trees, or the practice of forestry.

The aim of a forester is chiefly to grow timber of the most valuable kinds in the shortest possible time, on a permanent basis. There are side issues which under certain conditions become the predominating issues but these will not be considered here.

The value of timber is determined by its usefulness which in turn depends on its properties and completeness of utilization. Timber may be valued for its stiffness, toughness, hardness, durability, ability to take preservatives or finishes, easy workability, resistance to splitting in nailing, appearance, and a number of other properties or combination of properties. A forester should be well acquainted not only with present demands for timber but with the intrinsic value of the var-
ious species of wood which may govern future demands and
determine the kinds of timber most profitable to own 50 years
hence.

The amount of the timber on a forest which finally finds
its way into commodities of various kinds varies between
wide limits but averages about 25 per cent. That it is possible
to increase the percentage under present conditions has been
demonstrated in a number of practical ways. The greater the
returns from each acre of timberland, the greater is the in-
centive to grow timber.

The time required to grow timber of sizes which are
profitable to harvest depends on its value in different stages
of growth. Scientific research may develop uses which will
increase the value of young timber and thereby shorten its
financial rotation.

Research of forest products, therefore, affects the kind
of timber that should be grown, the length of rotation, the
profits derived from growing timber, and, as will be shown
later, to some extent the silvicultural methods pursued. These
subjects will be taken up in this order.

**Choice of Species**

How does research in forest products affect the choice
that a forester has to make between the many native and
numerous exotic species of trees that are adapted to his con-
ditions? The choice of species depends on the following
factors:

1. Market value
   a. Intrinsic value (as wood
   b. Market conditions—future markets should be
   c. Cost of getting material to market—ease of
      logging, weight (cost of handling and wheth-
      er it will float or not).
2. Adaptability of species to site.
3. Rapidity of growth. Rapidly growing species may be
   preferred to more valuable but slower growing
   species.
4. Cost of establishing stand. When natural reproduc-
   tion is used, some of the species on the ground
   must be selected. Under artificial reproduction
   some other species may be cheaper to propogate.
5. Resistance to injury by fungi, insects, wind, and fire.
6. Silvicultural value: Some species help to improve
   the site or the quality of other species in admix-
   ture with them.
7. Aesthetic value, especially on private estates and on
   public grounds used for recreational purposes.
Research in forest products affects the first of these only, that is, the market value. It may do this by finding more valuable uses for the timber and its by-products or by reducing present waste in harvesting and manufacturing. Examples are numerous.

As a result of research which showed that good paper could be made from aspen and jack pine, a firm in northern Minnesota selected these species to be grown on a sustained yield basis. Shades of Jehoshaphat! What timberland owner would have thought of encouraging the growth of "popple" and a scrubby pine 10 years ago?

Now the chemists at the Forest Products Laboratory have discovered a new process of making strong paper from hardwoods which yields pulp from 80 to 85 per cent of the original dry weight of the wood, as compared with 40 to 50 per cent for other chemical processes or about as good as for ground wood and at the same cost but with less power. The meaning of this can hardly be fathomed. It will give an added value to aspen and other northern hardwoods, and will open up the possibility of using southern hardwoods such as gums, sycamore, hackberry, magnolias, etc., for paper, thereby not only making the quick-growing second-growth southern hardwoods more valuable and more profitable to grow but, together with the comparatively recent adaptation of the sulphate process to southern pines, development of the paper industry in the South which has to import nearly all of its paper from the North. Already, research on the use of southern pines has made possible the use of 323,000 cords in 1920. Of this about one-half has been converted by the sulphate process. The development of these two paper-making processes will have a tremendous influence on southern forestry.

Before the utilization of western conifers for pulp and paper could be put into effect on a commercial scale a certain amount of research was necessary. The fitness of these woods, especially western hemlock and the true firs, for paper making is going to affect the regard in which the western forester holds these so-called "weed trees."

Chemical investigations on wood may bring to light new possibilities for use of certain species and show the limitations of others. For example, the utilization of western larch butt logs and mill waste in the manufacture of mucic acid may give this species a more favorable standing among foresters. On the other hand, research has shown that the gums are not so suitable as some other species for destructive distillation and should not be propagated with that as a primary or secondary object. In general, to what extent the chemical
conversion of waste of any species is feasible can be determined only by prolonged research.

Ailanthus and the empress tree (Paulownia tomentosa), both native of the Orient, are of the most rapidly growing hardwood species either native or introduced in this country, but their propagation would be risky without first inquiring into their technical properties. Too great haste in proclaiming these as excellent species to grow might lead to grief as in the case of the eucalyptus.

It has been determined that certain acacias have a large amount of tannin in the bark but the value of the wood would have to be ascertained before the species could enter into our forestry program.

Seasoning experiments must not be ignored in the choice of species. Although southern oaks grow rapidly and produce dense wood they have the serious drawback of being difficult to season even under the best methods. Any species which shrink and swell, warp, or check to a large extent had better be given thorough consideration before it is decided to give them a place in the forest for a generation or two. On the other hand, research in seasoning may show how to get around some of the bad features of certain woods. This has been done for red gum, and investigations are now planned to cut down air-seasoning losses in white fir for which species it was found that 53 per cent of shook rejects at a box factory were rejected on account of seasoning defects, a large part of which very likely can be prevented.

The value of second-growth eastern white pine as compared with western yellow pine lumber for boxes was established more definitely when tests showed that thicker boards are necessary for the sides, tops, and bottoms when made of the eastern species because of the larger number of knots in the box grades.

It had been believed in a general way that spirally-grained trees were not so desirable for structural purposes as straight-grained trees on account of the weakening effect of spiral grain, but it remained for research to show how much of a slope in grain could be permitted before the weakening became serious. This definite information is of material advantage to the forester in appraising the value of a stand or the value of an individual species subject to more or less spiral grain as compared with other candidates for perpetuation.

Perhaps the effect of research in forest products on the choice of tree species for intensive forest management is shown best in the field of wood preservation. The use of lodgepole pine for railroad ties, a happy outlet for this small
but abundant species, is made much more practical by first giving the ties a preservative treatment. The same applies to second-growth southern yellow pines with their wide sapwood, western hemlock, and numerous non-durable woods. The forester is no longer confronted with the problem of producing ties from slow-growing white oak, cedar, cypress, and other highly durable species, on a rotation period which makes their production profitable.

The preservation treatment of timber is strictly a research problem. No reasonable amount of ordinary "experience" would give sufficient information on the effectiveness of various preservatives, and the best methods of injecting them to solve the problem of efficient wood preservation.

Even the by-products of timber may be a determining factor in the choice of species, and research on the development of those by-products may turn the balance to one species or another. Within certain areas of the South, loblolly pine, longleaf pine, and slash pine can be grown. Loblolly grows very rapidly, reproduces easily, but does not produce dense timber or the quality of naval stores to make turpentine orcharding practical. Longleaf has these two qualities lacking in loblolly but is slow in growth, and reproduces poorly. Slash pine grows rapidly, propagates itself readily, produces dense timber, and excellent and abundant naval stores as early as at 15 to 25 years of age.

It is not uncommon to hear it said, however, that slash pine is more apt to become injured from turpentining than its associate, longleaf. Research shows that slash pine is a little more sensitive than longleaf to improper chipping and must be handled in a more conservative manner in order to make turpentining profitable, but with this precaution it certainly looks like the leading species wherever it can be grown.

The development of tannin extraction from chestnut and the use of the spent chips for pulp, the usefulness of the wood in general, together with its rapid growth from sprouts would make chestnut one of the most desirable of eastern forest trees if it were not for the blight. By developing the use of western hemlock bark for tanning purposes it might also become a more useful species.

In general, it may be said that research on forest products has two diametrically opposite effects on the choice of species. By ascertaining the properties and peculiarities of a species of wood its most efficient uses can be determined. This tends to make its utilization more and more specialized, and therefore the timber more valuable. That is what is happening to redwood now. On the other hand, a study of a species of wood shows how its handicaps can be avoided or
overcome by proper manipulation thus making it a more versatile species. Douglas fir, maple, and some other species, have a strong tendency to check when suddenly subjected to low humidities, as when brought into a heated factory, with the result that the manufacturer is likely to turn to other woods when at all feasible. Common sense would almost suggest the remedy, but curves on the relation of the moisture content of wood to the relative humidity of the atmosphere worked out in the laboratory are far more convincing and more definite in their application. The ease with which redwood, cypress, and eastern red cedar split in nailing has prejudiced many a carpenter against these woods, but data on the relation of the size of the nail to its splitting effect and holding power show that it often is possible to modify the dimensions of the nail so as to get equally strong nailed joints without serious splitting and so overcome the prejudice against such woods.

**Rotation Period**

The forester calculates the length of time required for a forest to bring the greatest mean net annual financial return from the anticipated value of the forest each decade or other suitable period and the cost of raising the crop. If the forest can be made to bring in earlier the greatest average return the length of rotation will be shortened accordingly. This can be done especially by an increase in the value of the younger trees. Here again preservation furnishes a good example of the effect of research. Second-growth loblolly pine trees large enough for round posts, ties, and poles are nearly all sapwood and have too little heartwood to be of practical value for such uses in their natural condition. To continue their growth until enough heartwood is formed would take many decades longer than is required to produce suitable material if given a preservative treatment.

An example of the rapid production of yellow pine posts is that of a tract in Louisiana on which two cuttings were made six years apart, each cutting furnishing 500 to 600 posts per acre. These posts were merchantable only when treated. By developing the processes of gluing up stock, especially with water-resistant glue, the use of smaller material will be encouraged, thereby giving the younger trees a higher value. That glued up stock gives satisfactory service for certain purposes is an established fact. It remains to develop it to a larger degree.

One of the men who attended the gluing course at the Forest Products Laboratory gave a cost figure of 4.5 cents per square foot for edge-jointed 5-16 inch thick yellow pine
panels (not veneered) made up of scrap lumber valued at $50 per M; while three-ply birch panels 5-16 inch thick cost them 9.1 cents per square foot. A direct comparison cannot be made between these two products since one is veneered and the other is not, but it shows that it is possible to glue up waste stock economically even if the waste is credited with its full original cost.

More information on the properties of some of the faster growing species such as catalpa, redwood, empress tree, etc., may cause them to be substituted for slower growing kinds with a corresponding shortening of the rotation period. However, before the most efficient use can be made of many species grown under environmental conditions differing materially from those which are obtained in the original forests, additional tests will have to be conducted to determine the influence of changed growth conditions on the properties of the wood, such as strength, shrinkage, freedom from warping, pulping qualities, and possibly durability. The properties of young rapidly growing trees may be appreciably different from those exhibited by trees of the original forest.

Any increase in the yields from young trees, for example, turpentine and rosin, storax, thinnings, will tend to shorten the rotation by making the period of maximum mean annual return come sooner.

**Increased Profits from Forests**

A long story could be written as to how research tends to increase the profits from the forests. Any paying method of reducing waste or making better use of what is now put to use will increase the returns from forest growth and make the practice more profitable. One of the common contentions of lumbermen is that it does not pay for private concerns to grow trees on a sustained yield basis and the best answer is that some of the more progressive lumbermen are doing it. There is a firm in Arkansas which practices forestry just as intensively as the Government does on nearby National Forests. The producers of redwood are intensely interested in reforesting their cut-over lands and making them yield a permanent income. The Great Southern Lumber Company is going into forestry “with all fours.” None of these concerns, however, is content with the old methods of logging and milling. To make it pay they must practice intensive utilization, and this is possible only after considerable research is carried on either by scientists in the laboratory, or foresters and accountants on their holdings.

Let us consider briefly some of the research work that has been done and is being done to reduce waste in the lumber industry.
The success of many forms of possible closer utilization will come only after timber gets much scarcer and higher priced. Enough research on the cutting and use of small dimension stock has been done, however, to show that it is only a matter of overcoming the inertia of an old industry in order to turn some of the wastes into dollars and cents at the present time. With the increase in percentages of low-grade lumber at mills, high freight rates, high labor costs at consuming plants, it has been shown that it is profitable to manufacture small dimension stock at the mill from slabs, edgings, crooked and defective logs, and low-grade lumber. A preliminary study of the use of small dimension stock in 1910 showed that out of a total lumber consumption of 40 billion board feet 9¾ billion were further reduced to smaller sizes at the factories of the secondary wood-using industries. That here is an opportunity to effect material reduction in waste and increase profits is no longer questionable.

How standardization of grades, sizes, and names reduces waste is not so obvious. We all can see how it would be more convenient for the consumer, dealer and millmen, but where does the increased profit come from? A few examples may make it clear. A lumber manufacturer in Michigan cuts hemlock heavy dimension of which dressed 2 by 4s measure 3¾ by 3¾ inches. He has a customer who also uses Douglas fir dimension, which for a 2 by 4 measures 3½ by 1¾, and wants the hemlock the same size so as to make the two interchangeable. The Michigan man promptly dresses his rough hemlock to finished Douglas fir size and so wastes an eighth of an inch on one side and one edge of each 2 by 4.

A mill in the South has export trade for about 1-6 of its one-inch lumber. Export trade demands that the lumber be 1¾ inches thick in the rough, domestic trade requires only 1 1/32 inches thickness. The mill cuts all of its inch lumber as for export trade and then dresses 5-6 of it down to same thickness and the 1 1/32 inches material is dressed to, or wastes 3-32 of an inch in thickness on each board which goes to the domestic trade.

Drum tests on packing boxes have shown that by the use of metal strapping (which requires only a very little metal) thinner sides, tops, and bottoms can be used in packing boxes without reducing their serviceability. In that way not only lumber is saved but the freight on the lumber in the box. If we used boxes like we did ten years ago considerably more lumber would be used for boxes and the extra freight charges on them would be no small item.

Since a great deal of the box shook material is made at the sawmills, any saving in lumber means an increase in
profits or returns from the timber land, for you may be sure the mill man does not let his customers get all the benefit of the saving.

What made this reduction in the amount of lumber in containers possible and safe? Answer, Research, and nearly all of it was carried on at the Forest Products Laboratory.

Tests on structural timbers show that knots do not seriously affect the stiffness of timbers, joists, etc. For small dwelling construction and other requirements in which stiffness rather than strength is the controlling factor it is entirely safe to use knotty timbers and joists. This information, if properly made use of, will increase the outlet of low-grade stock, which the lumbermen always find difficult to move, thereby increasing the returns from the forest.

It has been estimated that better seasoning methods could approximate a saving of $50,000,000 annually through reduction in stain, decay, checking, crook, warping, etc. This divided over our 50,000,000 M board feet of annual cut in all forms except firewood would increase the average value $1 per thousand. Although not all of this loss occurs at the mill, most of it does. A mill cutting 250,000 feet a day could—well, figure it out, how many foresters they could hire and how much fire protection they could institute on the proceeds of this one item alone. And don't forget that by improving seasoning methods there would be less low-grade stock on the market, and hence a better sale of intrinsically defective lumber which now goes to waste, but is not considered in the $50,000,000 above.

The preservation of timber makes possible the closer utilization of small trees of non-durable species and the use of tops of species like birch, beech, maple, and hemlock for ties and posts. Studies in the habits and requirements of fungi and bacteria have shown that it is practical to prevent the destruction of considerable pulp in storage. With an application of this knowledge a pulp mill can get larger net returns per acre from its forest land. Studies on the pulp yields of partly decayed woods shows that the yields were higher than is commonly believed. This should increase the value of rot-infected timber, as hitherto the practice has been to omit all rot entirely from the scale.

Studies of losses in the pulp and paper industry also have shown that the use of more refined methods might effect a saving of 10 per cent. This can be done by keeping all processes under control, and includes such factors as preventing pulpwood decay, more efficient barking, better chipping, regulating cooking conditions, and screening wash water (which in some instances alone causes a loss of 10 per
cent of the fiber). The recovery of valuable ingredients in spent digestor liquors offers a fertile field for investigation.

It has been demonstrated that a high grade insulating material can be manufactured by shredding up waste coniferous wood. If the market for this material were developed to the extent that waste makes it possible to market it, the net income from stumpage would be doubled, and the gross income more than doubled.

The greater use of glued up construction would effect a better utilization of waste, of undesirable species (for cores), and reduction in drying losses, since thin stock suffers less degrade than heavy stock in drying.

Numerous other examples could be cited of how research has improved methods in the lumber-manufacturing and wood-using industries and thereby made the practice of forestry more profitable.

Silvicultural Practices

Utilization of thinnings by cutting dimension stock from them, applying preservatives to small stock of non-durable species, converting small pines into pulp by the sulphate process which does not require that the material be barked, make more profitable the cutting of thinnings. This is a desirable silvicultural practice since it removes a fire hazard, gives the other trees in the stand a better chance to grow and makes conditions more favorable for reproduction.

Research on the relation of growth conditions to the specific gravity of ash show that slow growth at the beginning, followed by a normal or gradually accelerated rate of diameter growth will produce material of high quality and having uniform properties; if, on the other hand, the tree grows rapidly for a number of years and then slows down, the slower growth is not of as good quality as that which has grown slowly from the beginning. If further research shows that this relation holds in general it will have an important bearing on silvicultural methods which aim to produce timber of the best quality, since the forester can to a certain extent regulate the rate of growth by the closeness of the stand.

Fixing the requirements of dense yellow pine and Douglas fir gives the forester a standard to work to when attempting to produce the best structural timbers possible from these species.

In conclusion, it can be said that there is a more direct relationship between forest utilization and the practice of growing trees than seems to be taken into consideration in forest administration. Research in forest products has done considerable and likely is destined to do a great deal more
to make this relation more definite and comprehensive. By obtaining accurate information on the properties of a species in comparison with other species its most valuable field of usefulness can be determined and its value increased. This applies to both the common, well-known species, and the less common little-used kinds. By learning how best to manipulate the less desirable species of timber, and the lower grades of lumber, and overcoming the prejudices against such material its value can also be increased. The effect, however, will be a gradual sorting out of species leaving only those kinds for perpetuation which show the greatest usefulness.

Let me cite one more example to show how prejudices which affect the practice of forestry may be based on wrong assumptions and overthrown by accurate data. The lumberman is very apt to say that it is not practical to raise timber because the second-growth is of such poor quality as compared to virgin growth that it is not profitable to grow it. Mill scale studies show that there is much less difference in the percentages of grades than is usually supposed. The following table gives figures for the Southern Pine Association compiled in 1923 whose mills cut mostly virgin timber, and North Carolina pine which consists largely of second growth:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Southern Pine Association Per cent of total lumber</th>
<th>North Carolina Pine Association Per cent of total lumber</th>
</tr>
</thead>
<tbody>
<tr>
<td>B &amp; Better</td>
<td>17.3</td>
<td>18.9</td>
</tr>
<tr>
<td>No. 1 Common</td>
<td>27.4</td>
<td>13.0 a</td>
</tr>
<tr>
<td>No. 2 Common</td>
<td>42.6</td>
<td>46.4 b</td>
</tr>
<tr>
<td>No. 3 Common</td>
<td>12.6</td>
<td>15.9</td>
</tr>
<tr>
<td>No. 4 Common</td>
<td>(insignificant)</td>
<td>Red heart and bark string</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.7</td>
</tr>
</tbody>
</table>

a This covers a narrower range than No. 1 Common.
b This covers a wider range than No. 2 Common.

It is true that the boards of second-growth pine average narrower, but wide boards are going out of style anyhow. The more extensive use of glues has materially affected the size of lumber used.

More efficient utilization of timber and by-products will materially increase the financial returns which is one of the most needed inducements for the practice of forestry.

Accurate information on various phases of wood utilization will have a tendency to stabilize the market, because the timber grower will know better what his timber is worth and the buyer will know better what he can afford to pay for it. This will go a long way in putting the practice of forestry on a sound basis and eliminating some of its risks.

I wish it were possible to say that more efficient utiliza-
tion of forest products would affect the practice of forestry by making it possible to get along with less timberlands, but Mr. Winslow has shown in an address delivered at the meeting of the Society of American Foresters in Baltimore (1923) that even if all of our available 470 million acres of potential forest land were put to growing timber under highly intensive forest management we could not keep up the present per capita consumption (assuming a normal increase in population). And all that research can hope to do is to keep the per capita consumption of standing timber from being forced to an unwholesomely low level.

Finally, since the business of the forester is to grow valuable timber, he, like the would-be philosopher, will have to go where the scientists push him, particularly those whose researches influence the value of the crop.
Forestry Extension in Middle West

Irwin T. Bode
Iowa State Extension Forester

In the last issue of the Ames Forester, there appeared a discussion relative to Forestry Extension as applicable to the State of Iowa and presenting some of the difficulties and problems encountered in developing the work. Suffice to say here that the need for forestry in this part of the United States is as apparent now, if not more so, than it was a year ago, and the problems have changed but little. The following summary presents a survey of the situation as detailed before.

The Early Problems of the Work

a. Educating the Forestry Extension Worker:
As to the workings of the Extension Department and general policies of administration,
As to the best established methods of carrying out Extension work,
As to the attitude of the farmer and the people of the state towards extension work in general and especially toward Farm Forestry.

b. Educating the Forestry Field in the State (including the administration of the Extension Office):
As to the meaning of Forestry in Iowa,
As to the work that could be accomplished,
As to the fact that Forestry Service was available as such and not as a part of some other line of work.

It is interesting now to glance back over the past two and a half years of effort and review what has evolved.

Development of Policy

A start was made by working through the general Extension offices and the county agent’s offices to familiarize the field with the work; that is to say, efforts were devoted to placing plans and purposes of the Forestry Extension program in the hands of these offices in expectancy that they would in turn get to the field through proper channels. The reason for adopting that policy was the early determination to carry out the work if possible along the same lines established for the other Extension activities.

This gave rise to two problems: (1) the education of a man trained in forestry as it is generally conceived of, who was turned loose into a highly developed Extension field with no knowledge of Extension methods; (2) the competition with lines of work which have been long established and have grown beyond the propaganda stage and which are accepted by the public of the State as the important if not the only worthwhile lines of endeavor.
In attempting a solution of these problems it was soon realized that probably it would be a long while before any real work in the field was accomplished if it depended upon already established Farm Bureau committees, etc., to absorb enough of the importance of the problem to carry out the program of work outlined. This was chiefly because their time and attention was busily occupied with problems under way. The committees and men in charge of the community programs of work would no doubt have to have the new problems brought to them from the field itself. With this lesson learned, it was then decided to start from the other end. A definite program of direct contacts was undertaken in the field itself. This dealt with the county agent and with the farmers themselves wherever there had come a call for assistance in forestry lines. Every opportunity was taken to get the county agent out to the farms on which these problems existed and, almost without exception, the result was a new conception of what the forestry extension work was really trying to accomplish. Of course, a larger showing might have been made in people reached and meetings held if other types of work were undertaken, but, as has been stated, the object was to form a foundation for the Forestry Extension along the same lines as other Extension activity and with the farmers themselves in the hope that farm forestry could be linked up directly to the big industry of the State and with as little effort lost as possible. However, we realize that there is a field of work left which is large and important and as yet untouched outside of the farm problem. This no doubt is more true for Forestry than for any other type of Agricultural Extension.

The program of direct field contacts bore its fruit. It resulted in a number of farmers and county agents throughout the State getting in touch with the work, and when the calls for other forestry work reached these men, they were awake to the possibilities of having them answered in the same way that all other agricultural problems could be answered. A few demonstrations began to be held. The inquiries for information on the various forestry problems began to be more and more numerous. Apparently there were plenty of problems waiting to be solved and the people were beginning to appreciate the importance of these problems.

Particular pains have been taken from the first in answering inquiries by correspondence. As full information as possible has been given and always the suggested opportunities of assistance through the Extension Service have been carried out in the field. It might be called selling Forestry to the farmers.
The growth of Forestry Extension in Iowa is indicated in the accompanying charts.

**GROWTH OF FORESTRY EXTENSION IN IOWA**

**Demonstrations Established**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Demonstrations and Counties Doing Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921-22</td>
<td>(11) in 12 Counties.</td>
</tr>
<tr>
<td>1922-23</td>
<td>(9) in 5 Counties.</td>
</tr>
<tr>
<td>1923-24</td>
<td>(17 held) in 12 Counties.</td>
</tr>
<tr>
<td><em>Total</em></td>
<td>31 in 16 Counties.</td>
</tr>
</tbody>
</table>

**Number of Demonstrations and Counties Doing Work**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Demonstrations and Counties Doing Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921-22</td>
<td>(12) in 12 counties.</td>
</tr>
<tr>
<td>1922-23</td>
<td>(21) in 16 Counties.</td>
</tr>
<tr>
<td>1923-24</td>
<td>(31) in 11 Counties.</td>
</tr>
</tbody>
</table>

***Number of People Reached***

<table>
<thead>
<tr>
<th>Year</th>
<th>*Number of People Reached</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921-22</td>
<td>690</td>
</tr>
<tr>
<td>1922-23</td>
<td>850</td>
</tr>
<tr>
<td>1923-24</td>
<td>855</td>
</tr>
</tbody>
</table>

*Record for 7 months.*

*Measured by “people reached” because demonstrations are possible for only a small part of the work under this project. It includes meetings, advice, tours, farm and home visits, etc.

**INFORMATION LETTERS SENT OUT**

<table>
<thead>
<tr>
<th>Year</th>
<th><em>Record for 7 months only.</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1921-22</td>
<td>345</td>
</tr>
<tr>
<td>1922-23</td>
<td>359</td>
</tr>
<tr>
<td>1923-24</td>
<td>400</td>
</tr>
</tbody>
</table>

*The fiscal year runs from July 1 to July 1; hence 1923-24 is incomplete.

**FARM AND HOME VISITS**

<table>
<thead>
<tr>
<th>Year</th>
<th><em>Record for 7 months only.</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1921-22</td>
<td>No Record</td>
</tr>
<tr>
<td>1922-23</td>
<td>48</td>
</tr>
<tr>
<td>1923-24</td>
<td>52</td>
</tr>
</tbody>
</table>

Total number of counties in which some definite type of forestry is under way 38.
The Forestry Projects

At the present time Forestry Extension in Iowa is being carried out under three definite projects as follows:

F-1—PRESERVATIVE TREATMENT OF FENCE POSTS AND FARM TIMBERS.

OBJECT:
(1) To conduct at least two demonstrations in each county to show how to set up and operate a farm creosoting plant.
(2) To have the co-operators keep a check on costs and increased durability so that the actual saving can be observed.
(3) To get three other users of preferably native species of posts and timbers to start treating work.

F-2—FARM FORESTRY SERVICE PROJECT.

OBJECT:
To provide forestry assistance and allow for a program of miscellaneous forestry work:
(a) Consultations in tree work and care of woodlots (thinning woodlots, removal of woodlot crops, regeneration of
woodlots), (b) plans for shelterbelts, (c) meetings on woodlots, tree planting, wood preservation and general forestry subjects.

It is impossible for specialists to make special trips to counties on consultation work for individuals. However, there are many individual problems which ought to be handled but which require more specific help than can be given at general meetings and demonstrations.

F-3—TREE PLANTING—SHELTERBELTS AND WOODLOTS.

OBJECT:

To establish demonstration shelterbelts or woodlots, as new plantings or as renewals. To discuss methods of setting trees, kinds of trees, spacing, etc. To furnish tree planting information through meetings, conferences and illustrated talks.

Some Results Obtained

During the year July 1, 1922 to July 1, 1923 Farm Forestry Extension was carried directly to 21 separate counties: wood preservation demonstrations were carried on in 5 counties, planting demonstrations in 16 counties, and farm forestry service demonstrations in 2 counties. A total of 1,741 people were reached by direct contact through 25 demonstrations, 30 meetings, and 360 interviews and conferences.

Three hundred and fifty-nine letters with information on farm forestry subjects went out to 75 counties in Iowa. Information has been sent out of the State in 46 letters.

There were received from the press for distribution the following:


Extension Bulletin No. 109, "Longer Durability for Fence Posts and Farm Timbers."

Extension Bulletin No. 110, "Improving the Woodlot and Farmstead."


Mimeographed: "How to Use Wood Fuel."

"Why Use Wood Fuel."

There was a total distribution of these publications, almost entirely in this State, of 18,620. Ninety publicity articles were prepared dealing in the main with the experiences of farmers in woodlot or other forestry work.
Some General Conclusions

1. Three outstanding conclusions are to be noted in connection with Forestry Extension in Iowa.

   a. The rapid expansion of planting work.
   This has been somewhat of a surprise because it was thought that probably the inspiration for new planting would be hardest to put across. Important phases which have come out in the planting work are the necessity of regular inspections and the instilling of ideas of replacements and staying with the planting to obtain a full stand.

   b. Inquiries regarding treating of posts and the general attitude showing clearly that the cost of fence up-keep is a real problem.
   The actual work accomplished in treating posts to date does not measure the recognized importance of the problem. It requires an initial outlay of $50.00 to $100.00 to start an average farm post treating plant, and the farmer has been making as few investments of this type as possible. A good deal of the demonstration work which was scheduled last year, was postponed because of lack of preparation by the communities attempting the demonstration.

   c. The response to the call to utilize and harvest wood-lot land and crops on a business like basis, the same as any other farm land or farm crop has been more than expected.

2. One of the big problems has been to get the people of the state to think of forestry as forestry and not as something else. Forestry has seemed to mean something foreign to Iowa and Iowa conditions. As the farmers have gotten the conception of forestry as a distinct problem they have grasped more and more of the significance of the forestry problems in the state and the value of the work.

3. We recognize that there is distinct forest land in Iowa and a forestry problem which if solved will be economy for the state. Yet, we try to keep our own enthusiasm from broadcasting the view that we believe Iowa would make more money from timber crops than from corn and hogs. There may be certain few localities where timber or fruit crops or garden or truck crops can be made the major issue. But in spite of our own enthusiasm, we believe we have to face the fact and recognize the job to be one of fitting in and rounding out a full program of soil utilization and economic farming by showing the uses of minor industries in supporting the major.
4. In our forestry work, where we find that soil which is better suited to production of timber as a secondary crop and that this would fill in the general agricultural program, we run into the marketing phase of the industry. Net return is the big point of interest to the farmer, and when it comes to the production of surplus wood crops the farmer wants to know where and what the net return is. He is having troubles even with the marketing of staple farm crops, much less with the marketing of specialties. If we are going to produce surplus of special crops, we must teach salesmanship.

CREOSOTING FENCE POSTS
Through farm demonstrations the farmer learns how to utilize his wood to better advantage.

In this connection, in Forestry Extension, we are up against one of our biggest problems in preaching use of waste land in certain sections for timber crops and management of native woodlands without being able to demonstrate definitely what disposal can be made of the surplus crop beyond the home or farm use. Our work therefore, to date, has been on the basis of the value of timber and trees in producing a crop for economic consumption on the farm where grown rather than on the basis of holding forth a new crop for the Iowa farmer to make money out of. This does not mean that we have not made use of every opportunity to give out results where farmers have been able to dispose of surplus timber crops at a profit.
5. It will be necessary for us to organize some method of giving individualized service. We find the woodland and planting problems to vary so much that it is difficult to give out the best advice in a meeting or demonstration. We have made some attempt to solve this problem by means of the farm tour in which a large number of visits can be made and problems discussed in the field with the individual farmer.

6. The long time nature of our forestry work makes the reporting of concrete results difficult. However, some indication of results have already been obtained.

7. It is gratifying to note that Iowa even though essentially agricultural, is among the leaders in Forestry Extension activity. There are some five or six states employing full time Extension Foresters and Iowa is one of them. The efforts being made in Iowa to collect data, keep accurate records, measure results and carry out follow-up work, are apparently in advance of many of the other states. To date, Iowa has been successful in carrying out the Forestry Extension program under the regular administration of the Agricultural Extension Department.
The state of Mississippi was once rich in its natural resources, especially in timber. Much of the virgin timber has been removed. Governor Whitfield in his inaugural address urged the citizens to get back of a movement to inaugurate a system of reforestation. The state is rich in species of trees which will make valuable timber, and much of the state can never be used for agricultural purposes.

The northern half of the state comprises good agricultural land, and there is no better region in the United States for the production of cotton than the Yazoo delta, the rich overflow alluvial lands of the Mississippi and Yazoo rivers.

In this short paper I want to discuss more particularly the gulf coast country which is practically a flat, level plain. The flood plain of the river is shallow and only as you get back of the coast can you see the influence of the erosive power of the streams. Throughout the coast region near the Gulf of Mexico the soil is sandy and after every rain the little depressions contain standing water. This same type of swamp occurs back a few miles from the coast. The soil on the immediate coast is sand mixed with little yellow clay, or in some soils back from the coast considerable yellowish clay. The dominant growth on this plain when the forests are removed consists of a species of blue-joint (Andropogon virginicus and A. glomeratus), nut-grass (Cyperus rotundus) and panicum grass. These fields when left to nature soon become covered with the old field pine (Pinus taeda) and the long leaf (Pinus palustris). It is an odd sight to see the four to six year old long-leaf pine with its single main shoot and long leaves in the old fields. Reforestation in this country is not difficult because trees grow like grass. However, it is customary to burn these old fields to make the area suitable for grazing purposes.

Trees grow rapidly because of the long season and the abundant rainfall. In the course of my winter's visit here it has rained two or three times a week, not little showers but a "down pour." The species of trees are numerous but it is rather singular that there are no cottonwoods and in this coast country the elms and hackberries are scarce. Numerous sycamores are planted but I have seen none in the woods, though they are common in northern Mississippi and Tennessee. The chief glory of these forests are
the great magnolia (*Magnolia foetida*) which like the live oak (*Quercus virginiana*) is evergreen. Then too, the water oak (*Quercus nigra*) and the sweet bay (*Magnolia glauca*) are more or less evergreen. There are magnificent magnolias here some of which are 3 to 3½ feet in diameter; also large live oaks 3 to 3½ feet in diameter, with a spread of more than 150 feet. I counted 230 annual rings on a tree 39 inches in diameter. The live oak is certainly a picturesque tree and there are many of them in this region. The Spanish moss hanging from these trees in long festoons gives them added charm.

There are several other species of oak here; I have not been able to identify all of them. The Spanish oak (*Quercus pagodaefolia*) which the natives call red oak, a beautiful tree with valuable wood. Then there is the Black Jack, a small scrawny tree with rough bark which is similar to the Black Jack of Iowa (*Quercus marylandica*). There is an oak of the white oak group, the post oak (*Quercus stellata*), and the water oak (*Quercus nigra*) a very variable tree as to its leaves.

The swamps abound in cypress (*Taxodium distichum*) but most of this has long since been removed on the coast. There is still considerable cypress a little ways back from the coast along the streams. At this time of the year (Jan.) there are no leaves on the trees but the young pendant pistillate cones hang from the branches gracefully. The swamp gum (*Liquidambar Styraciflua*) with its corky branches, the sour gum (*Nyssa uniflora*) sometimes attain large size. The great buttresses on the tree are interesting. Since the tree grows in swamps aeration is essential and these buttresses help in the process of aeration, just as the cypress knees on the cypress.

The Bermuda Cedar (*Juniperus Bermudiana*) is one of the unique conifers of the gulf coast country. Some of these trees have trunks 2 to 2½ feet in diameter. The branches are quite flexible. The dominant pine of the upland is the short leaf pine (*Pinus Taeda*) extremely variable. It makes a fairly rapid growth. The long leaf pine (*Pinus palustris*) is far less common than the short leaf pine. It occurs in the sandy uplands, making a fairly rapid growth. I counted 135 rings on a tree 30 inches in diameter. Another specimen 14 inches in diameter was 27 year old. There is also another pine, the Caribbean Pine (*Pinus caribaea*). This species occurs in low grounds and is a coastal species while the long leaf pine occurs inland for some distance.

Several shrubs are abundant along the coast, the Yaupon
(Ilex Cassine), especially in sandy soil, and the wax myrtle or bay-berry (Myrica cerifera) and (Myrica inodora). A stump of Pinus Taeda 2 feet in diameter was 76 years old, a stump of the Cuban pine 26 inches in diameter was 87 years old.

Rate of Growth of Trees

It is interesting to note the rate of growth of trees in this region. The young trees of Pinus palustris makes more rapid growth than any other trees in this region. However, after fifteen or twenty years, the growth is not so rapid. The annual growth is given in inches.

Pinus palustris: 43, 38, 23, 20, 27, 26, 27, 14, 6, 10, 18, 11, 15, 18, 11, 15, 18, 6, 8, 20, 25, 24, 25, 10, 9, 10, 16, 12.
Pinus Taeda: 7, 14, 18, 15, 22, 18, 12, 10, 11, 7, 16, 19, 23, 12, 20, 21, 9, 15, 15, 8, 15, 8, 6, 14.
Juniperus Bermudiana: 2½, 3¾, 4½, 6, 4¼, 6¾, 2½, 4½, 3¾, 6½, 4¼, 2½, 3¼, 4¾, 4½, 4½, 5, 5, 8½, 3¾, 5, 7, 2.
Quercus virginiana: 5, 4, 6, 7, 5, 3, 4, 4, 5, 2, 4, 3, 10, 11, 9, 8, 5, 4, 3, 10, 11, 9, 8, 5, 4, 6, 8, 7, 3, 5, 8.
Quercus marylandica: 4, 7, 3, 2, 4, 4, 6, 7, 10, 8, 9, 4, 10, 8, 6, 8, 12, 6, 6, 10, 12, 12, 11, 7, 6.
Quercus nigra: 3, 8, 10, 6, 3, 8, 5, 6, 4, 7, 11, 12, 5, 6, 8, 15, 9, 10, 8, 11, 9, 8, 6, 8, 12, 10, 11, 6.
Quercus stellata: 6, 7, 9, 6, 8, 10, 8, 7, 6, 10, 12, 6, 5, 11, 14, 6, 8, 10, 6, 4, 14, 11, 12, 10.

The percentage of tree species found in different areas and soils may be seen from the following table:

<table>
<thead>
<tr>
<th>Sandy Barrens</th>
<th>Hansboro, Miss.</th>
<th>Gulfport</th>
<th>Cedar Lake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quercus virginiana</td>
<td>64.9%</td>
<td>23.5%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Pinus Taeda</td>
<td>11.2</td>
<td>21.5</td>
<td>35.3</td>
</tr>
<tr>
<td>Pinus palustris</td>
<td>10.</td>
<td>16.5</td>
<td>10.2</td>
</tr>
<tr>
<td>Pinus caribaea</td>
<td>0.</td>
<td>0.9</td>
<td>0.</td>
</tr>
<tr>
<td>Quercus nigra</td>
<td>4.3</td>
<td>9.2</td>
<td>0.</td>
</tr>
<tr>
<td>Quercus marylandica</td>
<td>5.2</td>
<td>7.6</td>
<td>27.13</td>
</tr>
<tr>
<td>Quercus podogaeifolia</td>
<td>3.5</td>
<td>7.0</td>
<td>10.15</td>
</tr>
<tr>
<td>Quercus Bermudiana</td>
<td>0.9</td>
<td>0.</td>
<td>0.</td>
</tr>
<tr>
<td>Magnolia foetida</td>
<td>0.9</td>
<td>0.</td>
<td>0.</td>
</tr>
<tr>
<td>Ilex cassine</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
</tr>
<tr>
<td>Myrica cerifera</td>
<td>7.4</td>
<td>6.2</td>
<td>0.</td>
</tr>
</tbody>
</table>
The sandy barrens contain but little humus, but it is really wonderful how the trees will grow. Originally the region was heavily timbered with pine, but after the clearing the live and other oaks have become dominant. The undergrowth in pine forest contains a great deal of the Yaupon and a kind of palm. The latter is used as food for cattle. The **Ilex myrica**, palm, **Similax** and sometimes the Cherokee rose are evergreen.

### Sour Gum Swamps

<table>
<thead>
<tr>
<th>Species</th>
<th>Gulfport</th>
<th>Hansboro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pinus caribaea</td>
<td>20.3%</td>
<td>23.9%</td>
</tr>
<tr>
<td>Myrica cerifera</td>
<td>12.9%</td>
<td>15.9%</td>
</tr>
<tr>
<td>Magnolia glauca</td>
<td>6.9%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Bay</td>
<td>9.2%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Liquidambar Styraciflua</td>
<td>5.5%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Nyssa uniflora</td>
<td>45.2%</td>
<td>25.5%</td>
</tr>
<tr>
<td>Taxodium distichum</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

### Cypress Swamps

<table>
<thead>
<tr>
<th>Species</th>
<th>Hansboro</th>
<th>Biloxi</th>
<th>Gulfport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxodium distichum</td>
<td>80.0%</td>
<td>65.3%</td>
<td>70.2%</td>
</tr>
<tr>
<td>Nyssa uniflora</td>
<td>4.5%</td>
<td>2.5%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Magnolia Glaucial</td>
<td>5.3%</td>
<td>15.5%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Juniperus Bermudiana</td>
<td>1.2%</td>
<td>1.0%</td>
<td>0%</td>
</tr>
<tr>
<td>Pinus caribaea</td>
<td>4.2%</td>
<td>8.5%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Nyssa cerifera</td>
<td>4.8%</td>
<td>4.5%</td>
<td>3%</td>
</tr>
<tr>
<td>Salix nigra</td>
<td>0%</td>
<td>1.2%</td>
<td>15.2%</td>
</tr>
<tr>
<td>Liquidambar Styraciflua</td>
<td>0%</td>
<td>1.5%</td>
<td>0%</td>
</tr>
</tbody>
</table>

There are no depressions in the fine barrens with standing water, the water standing longer than in the sour gum swamps. The finding of **Juniperus Bermudiana** is an indication that the process of drainage has been carried on. The Bermuda cedar is a tree of the barrens.

### Enemies of the Forest

There are a good many enemies of the forest. Timber when cut soon undergoes rot and decay. The stump and wood of some species of trees rot much faster than others. The sour gum stumps soon decay, owing to the large amount of moisture in the soil and the large precipitation. Species of **Fomes** and **Polyporus** and **Schizephyllum commune** are abundant. **Fomes**, **Trametes** and other fungi are common. The Cinnabar fungus which in the north is so common on the
black cherry (Prunus serotina) is common here on various oaks like the live oak and water oak. The oyster shell fungus (Pleurotus sp.) is also common on oaks. It is interesting to note how rapidly some pine stumps decay but the long leaf pine which is very resinous remains sound for a long time. This makes the best kind of fire wood.

There are many insect enemies, one of which destroys the acorns of the live oak. Some of these trees therefore do not produce fertile acorns. I was also much interested in noting a gall insect on the live oak, which was very abundant. Dr. Gilman, to whom I sent a specimen writes me that it is either Neuroterus floccosus or Callirhytis flocculenta, according to Dr. Carl Drake.
The Michigan Land Economic Survey

Horace J. Andrews, Director

For two summers, 1922 and 1923, a peculiar form of so-called survey has been carried on in Michigan. Inventory of all natural resources and economic conditions describes this work better than the word "survey." Its official title, however, is "The Michigan Land Economic Survey." It is a new type of work for a commonwealth to carry on, and it is hoped by many that, if its findings prove of value, similar or identical work will be done in other states having land problems like those of Michigan.

Let us first look into the reasons for making this survey and its early history. The work is confined to the northern part of the lower peninsula and the upper peninsula. All of the land in the state is glaciated and in the upper part of the state there are large areas of light, poor, sandy soils. The bulk of all this area was once covered with a good stand of timber, both pine and hardwoods. The first development in the region took place when the lumbermen started operations. In a good many counties there was but little settlement or development at all until the logging camps and mills were put in. As long as logging and milling were carried on there was a certain prosperity in the country. Settlers came in and small farms were cleared up. These farmers made a go of it even though they often located on poor soils instead of the better ones because there was always work for a man, his boys and his teams in the logging camps in the winter time. He usually had a good local market in the camps and at the mill for his surplus hay, grains, milk, butter and eggs. Most of the counties soon developed regular county organizations with a county seat, courthouse and the regular corps of county officers. The bulk of the taxes in the county were, of course, paid by the lumber companies who owned practically all of the land and often most of the voters. Schools, roads, etc., were paid for by these lumber companies as they saw fit. As the counties grew older, some of the lumber companies cut out their holdings and took camps and mills to new localities where there was more timber to be cut. They still had the land on their hands, however. As soon as they had cut over a tract they usually tried to sell it for farm land more or less regardless of its quality or fitness for agriculture. Many settlers from the outside were brought in and put on lands where they were beaten from the start due to poor soils and a de-
clining local market. In practically no case was any attempt made to sort out cut-over lands first and develop the county on this basis. Big blocks of the poorest soil, land so poor that it never even grew good timber, were turned over to professional land operators at very cheap prices. These operators ran selling campaigns in Chicago and other cities to people who wanted to get back to the land but who usually knew very little about farming or soil values. They also operated in the corn belt, Ohio, Illinois and Indiana and sold to farmers who were interested in cheap land. It was astonishing how many people bought land without ever seeing it and also how many bought land that was light and poor even after seeing it.

Even after all their efforts at selling cut-over lands there were still vast areas unsold. Lumbermen usually hung on to these and paid taxes and interest charges on them in the vain hope that some day the whole country would be developed agriculturally.

Now, as some of the operators dropped out and new settlers came in, political control in a county often passed out of the operators' hands and the local people had things their own way. The remaining standing timber offered the biggest opportunity for obtaining taxes for roads, schools, etc., and the local county officials taxed the lumber companies on the theory that they were able to pay. They were too short sighted in most cases to see that this policy would make lumbermen cut out as soon as possible to avoid this burden of taxation. When this happened as it did, the big market for labor and supplies left the country. This meant that the cash income for most people had left. The country was relatively new. Outside markets were hard and expensive to reach. The values received from products raised on poor soil, shipped to distant markets and competing with products raised more cheaply on better soils, were too small to make the game worth while. Many quit, others stuck on, not knowing where to go or what to turn to. They were, if located on the better soils, able to raise enough to supply family needs and got their cash from going over the cut-over lands and swamps and cutting out pulpwood, cedar ties, excelsior bolts, etc. Many of them were probably supported by children who went away to the cities to work. The big areas of cut-over land with their large amounts of brush and slash never escaped fire for any length of time. Large areas were burned over and reburned at regular periods after they had grown enough wood material to make another fire. Other areas escaped fire for varying periods of time and today we have
second growth of so-called scrub; oaks, poplar, birch, jack pine, etc., of various ages.

So we find some of the counties in the state practically bankrupt as an organization. They are receiving more from the state in school, road and police funds than they are returning in the form of taxes. They have farmers on all types of soils from the best to the poorest, and at the same time there are large areas of good raw land undeveloped, but in the same township with this good land there may be a block of the poorest land being pushed for sale by some land shark. In the same township we can find some farmers fairly well off and others about starved out on poor soils. We can find thousands of acres of land reverted to the state for non-payment of taxes, scores of abandoned farms, thousands of acres fire swept, idle and non-productive of even scrub timber.

There will also be many acres of different sized second growth and with new demands for wood and wood products many of these stands that were considered worthless scrub a few years ago now have a merchantable value.

What about this land that has reverted to the state and what about the many other acres that will revert in the near future? Is it non-agricultural and if so, will it raise timber? If it will raise timber, what kind will it raise? Will this come naturally or will it have to be planted? How many acres of good, poor or medium soil are there in a country? Can a county
as a unit handle its poor lands in timber or is it a state problem? What should be done about fire? If the county has good lakes, streams and woods, how much fish and game will they produce and what is the money value of this to the county? In other words, what is tourist traffic worth to the county? How much water power is there and where is it? What is it worth? These are samples of many questions which arise in connection with these counties. No one man or group of men have ever known or now know the answers. Ideas of different parties differ according to how their points of view are influenced by personal interests in the country. What shall be the policy of the state in land matters in these counties? What can the county itself do?

When a business organization gets in a bad way and goes bankrupt, the receivers usually take an inventory of its property and condition in order to decide what to do with it. They are not so much interested in what happened, whether it was mismanaged, etc., as in the cold facts as to just what assets it has, where they are and what they are worth. They have to have these facts in order to decide what to do. So they take inventory and get the facts.

The same with a county or group of counties in a bad way. In order to know what to do, the state and county want the facts. In this case the facts have to do with kind, location and amounts of natural resources including land, crops, timber, water power, recreational values, etc.

Several years ago far-seeing people in the state were aware that things were not all o. k. The state Geologist got a bill through the Legislature authorizing money for such a survey but war came on and the money returned to the state. Later the Michigan Academy of Science became interested in the problem and got it started through a co-operative arrangement. The State Departments of Agriculture and Conservation, the Michigan Agricultural College, and the University of Michigan got together and put up money to carry on the survey in Charlevoi County in the summer of 1922. The Legislature failed to make an appropriation for continuing the work the following summer, but the United States Senate Committee on Conservation held hearings in Michigan in the spring of 1923 and was impressed with the work done by the survey the previous summer. Other people in the state were impressed with the work and so the Department of Conservation arranged to carry on the work for two years more.

Last summer the survey crew consisted of ten soil surveyors and ten foresters who were mappers or linemen. These men did the bulk of the detailed routine field work. In addition, there were two engineers on water power work, one
land economist on economic problems, one draughtsman, one staff soil surveyor, one staff forester and one inspector, (these three men checking the field crews), two cooks, the field manager and the director.

A field crew consisted of two men, one forester and one soil mapper. The bulk of the information they obtained was recorded in map form. They kept their location by means of compass and chain. Each crew ran twice through a section, down the section line and back through the center. The crews averaged from three to six miles of line a day, depending on type of country. Country one quarter mile each side of the line was mapped. The line proper was chained and all offsets paced. A scale of four inches to the mile was used and outline maps showing all the subdivisions in a section in dotted lines were furnished the mappers. The forester made two sets of maps, a topographic map and a base and cover map. The topographic map was not a contour map but was in the form of a type map. All the country was thrown into one of five classes, namely, level, undulating, slightly sloping, moderately sloping and step. An arbitrary limit expressed in percent of slope was put on each class. The forester then mapped these classes as types, drawing the boundary of each type and putting in the proper slope number. On his base and cover map he showed all streams, roads, trails, telephone lines, houses and other improvements. He also typed
in all land as either agricultural or plow land, permanent pasture or timber. Timber land was further typed according to a classification, based on species. This classification is too detailed for this article, but for example, type number 6 was oak hill type, type No. 7, jack pine, type No. 8, birch and popple, etc. Types were bounded by dotted lines and the type number written in. One, two or three horizontal lines were drawn in under the type number to indicate the condition of stocking, one line meaning well stocked and three lines meaning poorly stocked. The size of the timber was shown by putting the range in diameter of the trees after the type number. For example 7 (3-6) would indicate a moderately stocked stand of jack pine from 3 to 6 inches in diameter. In addition to these maps, the forester also kept a tally sheet on which he recorded information on lakes and streams as his line hit them. This was for use of the biologists who follow the survey crew the following summer.

The soil mapper maps the boundaries of the soil types which are defined according to a classification worked up in conjunction with the U. S. Bureau of Soils.

The hydro-engineers estimated the potential water power of all streams by getting the amount of fall, locating possible power sites, establishing gauging stations and doing some gauging. Their data will only be of value after readings have been taken at the stations for a long enough time to establish the average flow for the stream.

The land economist gathered data on land values, classes of land owners, taxes, exports and imports of agricultural and timber products and other information on the economic status and history of the county.

A crew of biologists studying fish and game will come in after the survey crew during the following summer. They are furnished the maps of cover and data on streams and lakes that the survey crew has gathered.

Last summer two more counties were covered, Ogemaw and Autrim. The crew lived in tents and used army cots and mattresses. Two cooks furnished very good meals and the crew was taken care of in better shape than most field crews. Camp was moved every week or ten days. Transportation and moving was taken care of by three Ford touring cars and one Ford truck.

The job of the survey is to gather the facts in the most thorough and most efficient manner. The men responsible have to determine what facts are worth while and how much ought to be spent in getting them. What to do with the facts when they are obtained and properly presented is another
story. When enough counties are covered so that averages may be determined, the data and information gathered ought to help to do two things; first, to prove to the citizens of the state and the state officials that certain conditions exist; second, to help the state and county governments in the formation and carrying out of a rational land and forest policy.
The Mississippi River Bottomlands

By B. Shimek, Ph.D.

A bill is now before Congress calling for an appropriation of $3,000,000 for the purpose of securing a wild-life reservation in the Upper Mississippi Valley. The contemplated reservation is to extend about 300 miles along the river from Rock Island, Illinois, to Wabasha, Minnesota. It would therefore include bottomland areas in four states, Iowa, Illinois, Wisconsin, and Minnesota.

This reservation should be made now, before further attempts are made to drain these lowlands. The draining of Muscatine Slough within late years, and the recent attempt to drain the Winneshiek bottoms clearly show what will happen if these areas are not preserved. The forests will be cleared and an attempt will be made to cultivate the soil. Both will result in the destruction of the natural plant anchorage which holds these soils in place in times of floods. All government works along the Mississippi, as well as the navigability of the great stream, are constantly jeopardized by the quantities of silt which are carried by the river and its tributaries. If the bottomlands are cleared, and the soils loosened by cultivation, the amount of this silt will be enormously increased, as it is also by the clearing and attempted cultivation of the slopes of the bluffs along both the Mississippi and its tributaries. As a matter of fact the future of the Mississippi river demands that not only its bottomlands and bluffs, but those of its tributaries as well, should remain covered with an anchorage of permanent vegetation. We are putting millions of dollars into Mississippi river improvements, yet in time these will be made useless if we do not reduce the load of silt carried by the stream. The problem is one of national importance.

The claim that is usually made by promoters of these drainage schemes is that valuable agricultural land will be secured, that riches will be added to the state, that homes will be built, etc., etc. The results seldom equal the expectations, and in altogether too many cases utter failure has resulted. In this connection we need but recall the attempted drainage of portions of Cairo lake, Rice lake, many of the kettle-holes in the Lake Okoboji region, Muscatine Slough, and the straightening of some of our streams, to find confirmation of the foregoing statement. The writer had charge of a drainage project south of Iowa City forty years ago, and to this day the drained land has little value.

We have been draining promiscuously; it is high time
that we adopt a selective policy. The whole drainage problem presents many sides, but we usually refer it to the engineer, who is competent to determine if an area can be drained, but who is not qualified, by training or experience, to decide whether it should be drained. It is especially notable that the all-important and really obvious relation of plants to this problem is usually overlooked or disregarded.

Nothing is more important to plants, cultivated or native, than the maintenance of a constant supply of moisture. This is necessary not only in the soil, but in the air as well. Plants cannot be grown successfully in the dry, super-heated atmosphere of the ordinary living-room, no matter how much they may be watered, for the plant must be protected by moisture in the air from excessive loss of water by transpiration. This supply in the air must be continuous, or the plants suffer. The removal of natural water-surfaces from which vapors rise continuously, inevitably results in diminishing at times the possible amount of invisible water in the air, and when we so reduce the water-surfaces of the state by drainage we kill the goose that lays the golden eggs!

Recent efforts to show that drainage does not affect rainfall are wholly misleading. No one who is familiar with the subject will assert that rainfall has been affected by drainage, for we have no exact information on the subject; but neither can any one deny it, for the same reason! To point to the record of rainfall for a few years in any Iowa locality for the confirmation of the statement that drainage does not affect rainfall is folly. For example, the rainfall at Logan, Iowa, has varied in nearly sixty years from 16 to 56 inches per year. During this period dry and wet years came irregularly, sometimes alternating, as in the year 1874 (28.4 in.), 1875 (42.0 in.), 1876 (28.2 in.), and 1877 (46.1 in.); or they came in irregular groups, as in the wet years 1882 (40.2 in.), 1883 (39.9 in.), 1884 (36.6 in.), and 1885 (40.2 in.); or the dry years 1893 (22.4 in.), 1894 (16.63 in.), and 1895 (26.12 in.).

No one has yet definitely ascertained the exact part which the various factors concerned in these variations play, and it is absurd to select any short period for the purpose of drawing conclusions concerning the influences which affect rainfall.

The fact is, however, that plant-welfare is determined not so much by the amount of the water which falls as by the conservation of that water for plant use through a longer period of time. The precipitation during a heavy rainstorm adds materially to the total for the year, yet it is likely to do vastly more harm than good, washing the slopes, flooding the bottoms, and otherwise injuring plants. The rain-gauge will not do for measuring plant possibilities!
Just what will result from the extension of drainage projects along the Mississippi is well illustrated by the outcome of the drainage of the "slough" which cut off Muscatine Island. Muscatine Slough, as it was called, in its original state was typical of the low bottomlands along the Mississippi, and the result of its drainage is just what may be expected from other similar attempts. The lands are of two types: the low portions, formerly covered much or all of the year with water, and having a black soil,—being direct "beneficiaries" of the drainage; and the adjacent sandy areas of slightly greater elevation, chiefly truck gardens, large portions of which are included in the drainage district, with secondary "benefits." None of these areas will sell for as much as the original cost of the land plus the cost of drainage, maintenance, etc., and the sandy areas have actually diminished in value because of over-drainage and the dropping of the ground-water level. Yet the owners of the latter were forced to pay for the "improvement"! A prominent farm-loan man of Muscatine recently declared that he would not loan a dollar on any of the land in the drainage district, and none of it finds buyers. The State does not seem to be able to dispose
of its lands in this area even for the amount of the delin-
quent taxes! And all this has resulted from the destruction of
the original Muscatine Slough, once a beauty spot crowned
with beds of lotus, its waters teeming with water-fowl above
and game fish beneath,—the latter spawning here in great
numbers! In addition to all this the Government is called
upon to assist in maintaining expensive levees to protect this
"reclaimed" land!

The careful investigation of the soil-problem in connec-
tion with the drainage projects on the lower bottomlands of
our streams would lead to the condemnation of most of them.
These bottomlands present three principal types of surface
features:

1.—Frequent and irregular areas are treeless, and are (or
were) covered with a flora largely that of the prairies, with
blue-stem and other grasses predominating. Such areas may
be seen below Ft. Madison, Iowa, above Savanna, Illinois,
near Bellevue, Iowa, at Prairie du Chien, Wisconsin, below
New Albin, Iowa, and at other points along the Mississippi.

These areas are mostly very sandy, and if the deep-rooted
prairie plants are destroyed by attempts at cultivation, they
are subject to erosion and shifting by water during floods, and
by winds during dry seasons. They should be left wholly
undisturbed. They are usually not very fertile, and hence do
not offer as much temptation as some of the other areas, but
they are numerous, and must be taken into account. If dis-
turbed they furnish much of the sand and gravel which over-
whelms more fertile areas during floods.

2.—The second type is the richer low alluvial land, which
is usually covered with timber. This is more tempting be-
because the soil seems to be richer, and, besides, the old-time
assumption that forests grow on the richest soils is still prev-
alent. The fact is that as a rule our forests start on poor
soils and gradually build up a veneer of good soil either by
arresting fine silt during floods, or by gradually developing a
leaf-mould.

On the bottomlands under discussion the trees start al-
most invariably upon gravel- and sand-bars, and the finer al-
luvium is deposited only after the forest vegetation has gained
its foothold. The upper Mississippi and its tributaries furn-
ish innumerable illustrations of this building up of soil in the
forest covering. Up and down along the river between Bur-
lington and McGregor, and beyond, you may now see these
thickets of tree-seedling starting out on almost every sand-
bar, and if you follow them, as I have done in some cases for
forty years, you will find that gradually, as the forest de-
velops, the floods deposit more and more fine silt and build up a soil, which is also reinforced by the decay of fallen leaves, etc.

I have personal knowledge of cases in which more than three feet of such soil have been deposited over sand-bars on which I saw such forest-beginnings. Remove the forest covering, and the floods will either sweep the fine soil away, especially if loosened by cultivation, or bury it under masses of sand and gravel. I have repeatedly observed both effects. Any effort to clear and till these areas simply invites disaster in the great majority of cases.

3.—The third type is that which is so low or flat that it is under water during much or all of the year. This includes the ponds and oxbow lakes, and the bottomland swamps covered with cat-tails, rushes, and sedges. These catch-basins, which are usually surrounded by trees, also contain fine alluvium, which makes them more tempting than the sandy areas.

If these areas can be drained they are in the same danger during floods as the cleared forest areas. In many cases, however, they are so low that they are almost or quite on a level with the water in the river, and complete drainage is impossible. Klum Lake in northern Louisa county, Iowa, furnishes an example of the mess created in such cases by an attempt at drainage.

There are, of course, who argue that protective works can be built and the flooding of these areas prevented. This argument is all too often advanced by those who want the job of erecting such works! Experience has shown that no such artificial checks are effective in times of greater floods. Our own experience shows it, and that along the Danube and other European streams is still more conclusive because it reaches over a longer period of time.

There are several objections to this scheme of checking floods:

First, it could be done only at enormous public expense, and even if successful, the result would be the “reclaiming” of land for which there is no pressing need, and which could at best only help a few speculators,—whether private owners or not,—to say nothing of the losses in other directions.

Secondly, as already noted, no such works furnish reliable protection against greater floods, and therefore those who would take the risk of settling upon these low lands would periodically be endangered. That there is little, if any, hope of permanency in the location of homes in such places is shown by the condition of the buildings where settlement has been attempted. I do not recall a single place where these
buildings indicate anything of great prosperity, or of permanence in home-building. More than once I have seen people taken from the roofs of their houses in boats during high water, and where there is such a menace permanent improvements are not encouraged.

Third, the construction of great levees would inevitably result in a narrowing of the channel, and the greater piling up of waters during floods. The present broad bottomlands spread the floods and thus diminish their heads. Along the streams at Dayton, Ohio, great reservoirs have been built to spread the overflow, and here in the Mississippi valley men are deliberately planning to destroy the natural overflow-reservoirs furnished by these lowlands!

Fourth. In some cases the underlying sands permit the seepage of water upon the drained lands during floods, even when the levees hold.

At best the land secured by the drainage of low bottomlands is inferior. Too often it is damaged by floods, as noted, but even where this is not the case the producing value is inferior, for in wet years it remains wet too long, and its crops are always in greater danger from early frosts.

Since this is the case, there seems to be no warrant for the great expenditures for drainage and the necessary protecting works, especially since we do not really need the land. Everywhere farmers are seriously considering the reduction rather than the increase in acreage under cultivation. We need better cultivation of our available farm-lands rather than an increase in superficially cultivated areas.

In conjunction with the evils wrought by the attempts to disturb these lowlands, it is worth while to set out the advantages which such areas present when left in their natural condition, as is contemplated under the pending bill. These advantages may be enumerated under the following heads:

1.—Prevention of the silting up of the Mississippi River.—I have already called attention to this important question. This will be a constantly increasing danger unless steps are taken to prevent the further destruction of the natural plant-anchorage of the areas involved.

2.—Recreation grounds.—Under natural conditions this area will become an accessible recreation ground for millions of people in the Mississippi Valley, and will be available for twelve months of the year.

3.—Fish-breeding grounds.—The water of these lowlands are the great fish-breeding grounds of the Mississippi Valley. What will happen to them if natural conditions are not pre-
served was well illustrated in the Muscatine area. I have personal knowledge of the fact that previous to the attempted drainage of that area, game fish, such as black bass, crappies, pickerel, etc., were very abundant in all the cut-off ponds or "sloughs" which then abounded, and it was common to see the "nests" of the black bass around which the parent fishes hovered for the protection of their spawn. All this has disappeared in that area, and this will be repeated in all similar areas if disturbed.

4. Fish-feeding grounds.—The lowland ponds contain great numbers of mollusks, crustaceans, frogs, aquatic plants, etc., which serve as fish-food, and all these can be protected only by preserving the natural conditions.

5. Pearl-button industry.—The river mussels, or clams, the shells of which are used in this great industry, are di-

rectly dependent upon migrating fish for their propagation and distribution, and this industry will be crippled or destroyed if places suitable for the fish are not preserved.

6. Water-fowl breeding-grounds.—Valuable game birds use these areas for breeding-grounds. They will increase under proper protection.
7.—Bird sanctuaries.—Our insect-eating birds are mostly timber species which will find food and nesting-places in the protected lowland forests. To these birds fleshy fruits and juicy caterpillars are equally necessary. Fruit-growers complain that their ravages upon cultivated fruits are increasing. This is because we have everywhere destroyed the berry-bearing woody plants, and the birds are driven to our orchards by hunger. Restore and preserve their natural food in the forests, and there will be much less cause for complaint.

8.—Fur-bearing animals.—Valuable fur-bearing animals, especially the muskrat and the mink, will be perpetuated if these, their natural habitats, are preserved. Under these conditions they will increase, just as the bison, once considered near extinction, have increased under proper protection until now it is reported that it will be necessary to dispose of the excess in the Yellowstone region to other reservations, or to hunters.

9.—Native food-plants.—These wet bottomlands naturally produce wild rice and the lotus, both valuable food-plants. Both could be greatly increased under proper protection of their natural habitats.

10.—Preservation of evaporation areas.—This important point has also been discussed. We often claim that our wealth is in the soil, but it is more nearly correct to say that it is in the water of the soil and the air. Some of the most fertile soils (when water is brought upon them) in the world are found in the desert regions of New Mexico. They lack water.

11.—Forest experimental work.—A large part of the bottomland area would serve admirably for forest culture, and if properly handled the forest could yield much valuable hard-wood without losing its value as an anchorage crop. Black walnut, sycamore, swamp white oak, and other valuable lumber-trees could be grown successfully.

12.—Scientific research.—The area is admirably adapted to scientific investigations along several lines. It is especially conveniently located for this purpose with reference to the educational institutions of the four states which include the area, and could, of course, be used by others. The following fields promise especially valuable results:

a.—Plant succession.—Important studies on plant succession are possible, particularly in relation to forest development and the dispersal of weeds along our streams.

b.—Soil building.—No better area could be found for the study of the development of our soils.

c.—Bird migrations.—If preserved, the area will continue
to be a great highway for bird-migrations, and will thus remain a great out-of-doors laboratory for studies in this field.

d.—Fish-foods.—Needed observations on the food of fishes, both plant and animal, could be made to great advantage, under the preserved natural conditions.

e.—Problems of scientific interest.—The area would offer splendid opportunities for the investigation of many purely scientific problems in botany, zoology, geology, meteorology, etc., etc.

All the advantages and opportunities are enumerated will be lost if the area is not preserved in its natural condition. The problem is of great direct concern to a large and populous section of our country, and in its economic aspects it affects the entire country. The valuable resources of the region should not be sacrificed for the questionable personal benefit of a few individuals!
Hawkeyes in Columbine State

By C. H. Greef

Place. Grand Central Station, Colorado Springs, Col.
Enter. Ten would-be foresters with duffle bags, knapsacks and various imedimenta. The curtain is rung up. The show is on. Please keep your seats until the show is over.

Council is held at the station and the orders are to move out to the Fremont experiment station one and one-half miles from Manitou. The distance is not great but it is up hill all the way. The gang arrives at 11:00 P. M. hungry and tired. Beds are made on the hard floor and all hands turn in.

![Image of a group of men in the wilderness]  

HAIL! HAIL! THE GANG'S ALL HERE!

After a sleepless night Dr. Bates, who is in charge of the station, directs us around and shows us the interesting equipment and explains the latest experiments. Time is short so we hasten thru the station and hit out for Pikes peak. Our guide is a man of about "Andy's" size. He is a glutton for punishment and tells us to do our resting on the down hill traveling. We are pretty green but we stick with him
and reach the foot of the mountain that night. The next
day we go to the peak of the magnificent old mountain that
guided the early pioneers across the great plains in former
days. The climb and the scenery were indescribable but a
bed felt mighty good that night.

After our mountain climbing trip we struck out for
Fraser which was to be permanent headquarters for the rest
of the summer. Fraser is a typical two garage town, with
a fine highway running thru it. We ran right thru with
the highway to a spot six miles from town. Here we offset
a quarter of a mile into the timber and established camp.

The camp was a model one. Six army tents with run-
ning water in each tent. Chief Engineer Coville established

![Camp "De Luxe"](image)

the water system. The running water was important but
the spruce beds will always command the warmest spots in
our memory when we think of Fraser Camp. Ensconced in
one of these it mattered not if mountain storm did rage.
Nothing could disturb a snooze in a spruce bough bed.

Our social activities in camp were also of major im-
portance. The leading club was the polar bears of which
his highness Sam Battell was chief Woof Woof. Sam was
aided and abetted by Svendby who saw to it that all the
good polar bears did their morning plunge in correct style. "Was the water cold? You tell 'em my teeth chatter."

Then also the wonderful nights of good fellowship around the campfire. A place to write letters and read around the cheery blaze. A place to write letters and read around the cheery blaze. A place to write letters and read around the cheery blaze. A place to write letters and read around the cheery blaze. A place where we heard great tales of "I remember—etc." The campfire was also the seat of learning where Dr. Kaufmann told us how he built the Moffat Tunnel and Ranger Johnson told us how to run a national forest.

The serious side of summer camp was well cared for by our field trips. The mountains offered marvellous opportunities to study silviculture in its various phases. They also served as obstacles for us to hurdle after Perkins Coville had run a base line along their foot. However we enjoyed hiking up and down them in our cruising and mapping. There were also many small mills in the near vicinity of camp which we studied.

During the latter part of camp President Pearson and Dr. Pammel visited camp. President Pearson entertained us with the story of his trip thru the Yosemite National Park and spoke of meeting our chief, Professor MacDonald out there. Dr. Pammel opened our eyes to the beauty of
the wild flowers which were so abundant around camp. We kept Doc busy telling us what this and that flower was.

Thus the summer passed. A merry succession of morning dips, porridge, field work, peanut butter sandwiches, afternoon showers, and glorious sunsets. Then,

The campfire's glow, the open sky,
A bed beneath the trees,
The solitude where embers die,
The forest scented breeze.

The deep dark woods where wood folk dwell,
Where rivers dash and foam,
The out-of-doors holds me in its spell,
And there I feel at home.

The duffle bags are packed, Reports are in. The curtain rings down on Camp Fraser.
JUST AS HARD-BOILED AS THEY LOOK
Foresters in the Tall Uncut 1916
Ten Summers of Camp With The Ames Foresters

C. W. Martin, '24

One of the most interesting and valuable quarters in the Forestry course is the three months' summers camp held in some distant forest where the embryc forester may learn what he is really striving towards and determine whether he is suited for the vocation which he expects to follow. It is interesting to trace the growth and development of the Ames summer camps which started in 1914.

The first camp was held on Star Island in Cass Lake, which is within the boundaries of the Minnesota National Forest. It was attended by 35 foresters drafted from the entire department. The camp was a splendid success and demonstrated the need of corn-fed foresters from a prairie state, for life in the tall uncut, to try them and see if they be fit to follow the arduous life of a forester. The 114 men proved themselves fit. In fact they proved they were as hard boiled as even the most uncurried devotee of saw and axe could
desire. Deeply smothered fires of forgotten scandal of the '14 camp still burn forth occasionally to delight the ear of ever-interested foresters. Fortunately, perhaps, the flames are subdued quickly and only a wisp of smoke is left to taunt the scandal hounds.

The next camp was held in 1916. This was the famous seven thousand mile camp which carried the foresters through nearly every state in the West including a 115 mile hike through Glacier National Park. This trip has been the envy of every forester since 1916. It seems that at heart the average forester is a rainbow chaser. He is interested in the new and the strange, and has an innate desire to visit the unfrequented parts of the world.

The 1917 camp began in Northeastern, Iowa, where occur the most extensive timber tracts of the prairie state. A few weeks later the camp was moved to the old stamping ground on Star Island in Cass Lake, Minnesota, where, to the satisfaction of the natives, Ames Foresters never permitted so much as a brush fire to occur.

The 1918 camp was truly a cosmopolitan one. It was held on the battle-fields of France, on the high seas, in the forests of France, Scotland, United States and Canada; aye, even in the "murphy" fields of old Ireland, for it will be recalled that a regiment of Foresters were on the Tuscania when that boat was torpedoed, and a number of the men
were invalided on the Emerald Isle for some months. The real forester could not stand tethered to his college while the maelstrom of the great war was urging him to do his bit for his country.

The summer of 1919 found the boys on the Arapahoe National Forest in Colorado. The fact that one Ames Forester chased a mountain goat, caught it, and had his photograph taken holding said goat, is a monumental piece of evidence of agility of the prairie type of forester when put to the test in the rockiest wilds.

In 1920 the Foresters went to Rocky Mountain regions in Montana and Wyoming, visiting the Yellowstone National Park enroute. Many wild tales have been told of bear raids and round-ups of these memorable days.

The summer of 1921 found the Foresters fighting mosquitoes in northern Minnesota. This camp was famous for Agony Quartette, esprit de corps, and fish stories.

The lure of the Southland attracted the 1922 men and they trekked down to North Carolina to learn Democratic politics at first hand. They managed to stay sober and out of
“LITTLE GREY HOMES IN THE WEST”—1919

TIMBER LINE TYPES IN COLORADO—1919
jail. However, the most hard boiled members of the camp turned yellow before camp was over. What do I mean, yellow? I mean they contracted the yellow jaundice. Yas suh!

THE "COVERED WAGON" IN YELLOWSTONE—1920

The latest summer camp broke out in Colorado where the gang amused themselves counting sheep and running around mountain ranges.

MOSQUITO FLEET IN MINNESOTA—1921
We have seen where the Ames Foresters have been and in a brief way what they did. Let us consider the average camp in more detail. The camp work covers timber cruising, log scaling, mensuration and siliculture. The student learns how to care for himself in the woods. He gets on speaking terms with 40's, sections and townships. He learns what a traverse is and how to make a contour map. These things are all of value to him in later days. He is fitted to go out in the field and do a creditable job of cruising or scaling in the summer. He has gained the experience so necessary when applying for work. He has found whether he is or is not a Forester.

His summer camp is also an asset to him when he returns to school in the fall. He is better acquainted with his professors and his classmates. He is more interested in his forestry subjects and is able to correlate his classwork with his field experience.

In conclusion, the summer camp has proved its value in the classroom and field. It is an institution for the promotion of good fellowship and friendly relation between faculty and student. It is the criterion by which the ability of the future forester is judged.
Forestry Club Activities

D. Nelson

The Forestry Club was founded in the spring of 1912. Its purpose being to bring the students and the faculty into closer relationship with one another. Every student enrolled in the Forestry Department is eligible for membership. The programs of the club are both technical and social in nature.

It was in the fall of 1914 that the official “stag shirt,” bearing the Forester's emblem, the pine tree, was adopted. The Foresters were the first on the campus to start this custom, and since then, nearly every Department has adopted a characteristic shirt and insignia.

The Forestry Club is, and always shall be, the most active club in Ames. To start the ball to rolling this fall, we went up to North Woods, and held our semi-annual campfire. Here we talked over the events of the summer, got acquainted with the incoming Freshmen, and feasted on hotdogs, buns, pickles, apples and cider. As the night grew darker and the fire glowed brighter, we swung into those good old syncopated tunes known only to the Foresters.

We had the opportunity of having a few Foreign students talk at some of our meetings this year. Mr. Retieif, of South Africa, told us of the Forestry conditions of his home country. Many of us had the opinion that, that country was nothing but jungles inhabited by savages, and we were indeed surprised to find that they had Forestry schools and were practicing Forestry very extensively. Mr. Dela Torre gave us a very interesting talk on Peru, telling us of the wonderful natural resources of that country.

Jack Hogan and “Fat” Karr are trying to decide whether they want to go to South Africa or South America. But after all, they are only human, even though they are Foresters, and the beautiful, dark-eyed “senioretas” are calling them to Peru.

When the $300,000 campaign was put over for the Student Memorial Union this year, the Foresters were among the first to go over the top with 100% life membership.

This year the Club had gold watch charms made. The charms were designed by Prof. Bode several years ago, but no definite action was taken until this year.

The main event of the year was the Convention of the “International Association of Forestry Clubs,” held here on March 6, 7 and 8. We were the host to men from Washington, Montana, Purdue, Minnesota and Penn State. All Forestry classes were dismissed for the meetings, where we discussed Forestry of different parts of the country, and prob-
lems common to every Forestry Club. On the evening of
the sixth, we had a banquet at the Cranford Coffee Shop.
There were 90 Foresters present, and with “Andy” as toast-
master, and the AMES quartet furnishing special music, we
passed one of the best evenings of the year.

In the coming spring quarter we are expecting to put
on a special feature show at the Vehesia carnival. Last year
we gave “The Shooting of Dan McGrew.” This year we
expect to give a Swedish Ministrel or a Musical Comedy.
We will also run a concession stand to help swell our bank
account.

Did some one say that there was Romance in Forestry?
There certainly is, and it isn’t necessary to go to the woods
to find it. This was proven last quarter when Landgraf,
one of our Freshmen got married. It is rumored and ad-
mitted by the participating parties that “Andy” and Miss
Fish are to be married within a few months. The entire
club wishes both couples all the happiness and good fortune
that the good Lord can bestow upon them.

OFFICERS OF THE FORESTRY CLUB

First half— 1923—1924
President........................................C. Prout
Vice-President..................................T. Kouba
Secretary-Treasurer..........................D. Nelson

Second half—
President........................................M. J. Hasek
Vice-President..................................T. Kouba
Secretary-Treasurer..........................D. Nelson

SOME MAH JONG FORESTERS “CHOWING”
A Night With Paul Bunyan
By C. Prout

I was sitting one night in one of those lumber camps so rare nowadays but common in northern Wisconsin, Michigan and Minnesota in the early days of logging. Pipes were all lighted. The air was getting heavy. The wind moaned and shrieked outside. A loose piece of tarpaper flapped against a window. The gang was in a thoughtful mood. As I looked about I studied their faces. There was Pierre, the crack teamster. Over in a corner sat Ole, the top loader of track ten. Near the stove was Mike O'Malley, bullcook and handy man around the camp, blasphemous as a sailor's parrot, as religious as a Saint of Dublin. Mike was the first to speak.

"Be jabbers and this is a fearful night. Reminds me of the night we had the wake for Tim. He was a square cuss. Tim and me grew up together."

"Oui, he was the bad night," Pierre was speaking. "She make the wind tonight. Not so bad like time I work for Paul. Paul, she make big cut over on Turkey River. By Gar she get cold that winter! Every morning we get up three clock to thaw out harness. Cookee she come round with grub ten clock and make big fire to thaw out grub. One night big wind come in sout east. Look pretty bad. Paul have big chains to hold camp down down. Sacre! she blow. Paul she goes out to look roun'. Wind pick up two lakes ice water and all and drop them on section of best white pine. Next day wind not so bad. Paul stick head out of door and wind take off all his whiskers, Paul she gets verr verr mad. He make big think. All of sudden she say boys we fix him and sure enough we put big sail on all sleigh and for three days we don't use the horse."
Big Ole stretched himself, yawned and then spoke in a voice that would have caused Michael Angelo to drop his paint brush and dive for the catacombs. "Wan winter Aye ban work for this har Paul. Paul had a big fish for his pet. That fish followed him aroun' for days like a dog. One day Paul cut big hole in ice to get drink and by golly that fish fall in and get drowned. Paul make official mourning for six weeks and all camp eat black bread for month."

And so the stories went around. All had worked for Paul or had had dealing with him. I could not begin to tell all that was told that night and the following nights but will attempt to tell a few of them.

Paul, it seems, had literary yearnings for he started a newspaper. Paul was very much in favor of education of the lumberjack. So we find that in between times when he wasn't breaking log jams and taking soundings in the cook's coffee pail, he edited this newspaper which gave to the crews the latest news of the day. It also contained a society column giving the favorite brands of tobacco enjoyed by the elite of his camps. There was also a column on self education. This endeavored to give the Jacks a chance to pick up in their calculus and their etiquette. Paul was very formal and no one was allowed to make any more noise than was necessary at the table. To gargle one's soup was the sign of a gentleman and to be able to strain one's coffee thru one's whiskers until it sounded like an aeolian harp was the ambition of all. Static was not allowed. Perfect harmony was the word.

Once when Paul ran out of F's he called the crew in from the woods to cut the lower part of the E's away so as to be able to use them in the place of the F's.

His press was a rotary affair run by Axhandleson, the famous squirrel. The squirrel was in a rotary cage covered with mirrors. When the squirrel would see the images in the mirrors it would become so angry that it would run to beat six band saws. Paul fed this squirrel antelope flesh to keep it in condition. Every evening six masseurs would rub the squirrel down and then put it to bed on a suspended bed of eiderdown.

The pulp for the paper, that is for each edition, came from three sections of spruce. It required ten carloads of ink to print the paper. The paper was printed in appropriate colors and was used for scarecrows by the farmers after the men had finished spelling out the words they could not understand. Paul had ten strapping newsboys each over 300 pounds in weight and over seven feet tall to sell the papers. They were known as the ten newsboys of the Round River.

The poetry section of the paper—and this was a large
section—was filled with quotations from the famous poets of the day such as Salome Jones, Beerkeg Mary and John Bearskin, the Indian poet of the St. Louis, whose melodious sonnets brought tears to the eyes of the boiled potatoes. These the boys read and memorized and on Sunday afternoons they would stand in the bunkhouse and recite between sips of Old Crow.

Before any man could work for Paul he had to demonstrate that he could handle a knife and a fork in a crowd. He couldn’t take any chances of having any of his men crippled at the dinner table. So Paul took all precautions possible. Those who failed to pass such tests were given a paper and given two days to pass the test.

Paul had all his men wear magnetic hobnails and provided them with blankets which had a few strands of steel wire drawn thru the ends. Then when they went to bed there was no danger of the men kicking off their blankets and catching the Flu. The blankets just stuck to the hobnails. This worked to a disadvantage once and almost lost Paul his best cook. The men were coming home one night and all tried to walk the rails of the logging railway. The minute they stood on the rail they were caught. The whole gang were late for chow and that made the cook so mad that he swallowed half a bale of Climax which he had chewed off in his anger, and almost died of indigestion. Paul doctored him with Sloan’s Liniment and Tanlac for two weeks before he showed signs of his usual appetite.

Big Babe, the ox, became very shabby looking and Paul decided that something was radically wrong. Keeping watch one day he discovered the boys were stropping their razors on the ox and using its horns for hones. Paul soon put a stop to this and Babe once more grew in favor and stature.

It was quite a problem to provide all the dainty necessities of life for Paul’s husky boys. Paul would plant several townships with potatoes and when the bugs came he sprayed the plants with arsenic from large balloons. One year there was a drought. Everything was drying up. Paul was sure that his potatoes were gone. One night he thought of a scheme and the next morning he sent for two train loads of onions. Paul shoved an onion in each hill whereupon tears came to the eyes of the potatoes and they watered themselves.

Many and long are the tales of the way Paul fed his men. Among these were the use of giant grain elevators for mixing the pancake batter in; employing colored boys to skate around the griddles with hams tied to their feet to grease the griddle. Those are but a few of the facts of the case. At on time Paul’s favorite teamster broke thru the
ice with a load of split peas. Paul couldn’t think of losing all those peas so he put some steam pipes under the lake and served his men split pea soup all that winter.

In order to save time in the morning Paul had the cock make some pancake blankets and each man was provided with one at the time or retiring for the night. In the morning they were eaten with great gusto by the men while they were dressing. It saved time and blankets.

One of the sawmills had a large stack and Paul sent Big Ole up to clean it. Ole had taken an extra large Chew of Copenhagen and when he reached the top he became very dizzy and fell into the stack. The fit was perfect. After falling a couple of hundred feet the air became compressed and shot Ole almost up to the top again. Then he dropped and again the air was compressed and again he was shot to the top. This would have continued almost indefinitely had not Ole’s clothes become worn and allowed the air to escape thus allowing Ole to land safely.

Ole said that he was not so much afraid of falling as he was of starving to death.

It was a large and irksome task to keep the bunk houses warm. The main house took 36 cords of wood to heat it for a day. Paul had his efficiency expert, Copper Boilerson study the problem. One cold night he hit on a plan that saved Paul from worry the rest of the year as far as the heating problem was concerned. He fired up the stoves and got them red hot. Then he froze them that way and thus preserved them red hot for the entire winter.

This new scheme pleased Paul very much. He decided to use it in another way. One night when it was very cold he went out and gave the commands for the spring drive. The words froze as they left his mouth and when the spring came and it came time for the drive there was no need of giving any commands for the drive. The words that Paul had repeated in the winter were thawed out and the men heard them as clearly as when Paul gave them himself.

The good old days are over. Wine, women and song are gone and with them went the pine and the old time lumberjack. No longer does Paul and his crew cut timber. No longer does his cookeye sound his call for chow. Where once the majestic pines ruled we find desolation. Paul lives only in myth and song and yet on a winter’s evening when the gang is in the bunkhouse, the spirit of Paul comes over the hills and permeates the air. Men light their pipes and go back to those days of yore in the tales of Paul, his ox and his famous crew.
THE AMES FORESTER

M. Hasek  P. Coville  Prof. G. B. MacDonald  D. Nelson
G. W. Orr  C. W. Martin
The I.A.F.C. Convention—A Record of Accomplishments

By Fred Trenk

The eighth annual convention of the Intercollegiate Association of Forestry Clubs was held at Ames, March 6, 7 and 8. While it would be impossible to print the complete minutes in this number of the Ames Forester, we are greatly pleased to be able to record a few of the “high spots” of the convention, and publish in full a few of the addresses and topical reports.

A survey of the work of the convention will show a number of pronounced changes from the former programs of these conventions. As a result, the organization itself has been changed. Early in the convention a committee was appointed to consider a redraft of the constitution with the end in view of authorizing the formation of sectional associations of such clubs as they desired for closer fellowship, more frequent meetings, less expense, and for the discussion of sectional problems and national problems of the clubs. The result of the work of this committee was, that national conventions were authorized every three years, sectionalization of clubs was sanctioned, and the name of the Association was changed. The new constitutions will be published along with this report.

A precedent was set in the number of topics assigned to various clubs before the convention, and actually discussed in worth-while detail during the convention. Every one of the problems selected affected in some way or other organization and functions of every member club. Following is a list of these topics:

1. Compilation of Forestry Club Songs.
2. The Forestry Club as an Employment Agency for Summer Jobs.
3. A Program of Professional Ethics.
4. The Forestry Club Publication.
5. An Ideal Yearly Forestry Club Program.
6. The Forestry Club as a Material Aid to the Forestry College or Department.
7. The Place of Alumni Advisory Boards and Alumni Associations.

Every session of the convention was opened with singing forestry club songs for fifteen minutes. It was agreed by delegates that every member club should get together copies of the forestry songs sung at meetings of all the member clubs, and send these to the Ames Club, the purpose being to compile a song-book of forestry club songs.
The annual banquet, held on the night of March 6, in the Cranford Banquet Hall, was one great success. Everything from the latest news of Paul Bunyon to choice bits of campus scandal came in for its share of publicity. Professor Andrews was toastmaster.

With a view toward linking the I. A. F. C. with an organization larger and more permanent, Yale and Washington are entrusted with the task of forming a junior membership with the Society of American Foresters, if such a move proves desirable.

The staff of the Ames Forester believes that for their permanent value, some of the topical reports should be published in this annual. Here are a few of them:

THE FORESTRY CLUB AS A SUMMER JOB EMPLOYMENT AGENCY

H. J. Andrews (Ames), (Graduate of Michigan U.)

The idea was not that the employment situation was handled entirely by the club. The jobs, of course, came to the faculty, but they figured that they didn't know all the students as thoroughly as the students themselves did, and they wanted student opinion on students who might be capable of filling jobs as they came in, so the Forestry Club handled part of the employment situation by doing this.

The man in charge of the employment agency had a card index file and in this file he listed every possible candidate for a job every spring. They got it up during the winter. He put on the card whether he was a Junior, Senior, etc., whether or not he had any experience. He simply went around to all the boys and put down all the experience they had had. This saved the faculty considerable work. The club took particular pains to see that the man on the employment agency was fairly responsible and did not give prejudiced reports and would be reasonably fair. The jobs were not turned over to this employment agency, however. The men on the faculty simply asked the student for all possible information and he gave them more information than they could have gotten themselves. This man should be a Senior or a post graduate.

PROGRAM FOR PROFESSIONAL ETHICS

D. S. Jeffers, Yale

Little has been written or said up to the present about a definite code of ethics for the profession of forestry, except for a few short articles, two of which are by graduates of the Yale School of Forestry. The reason for the dearth of expression has probably been due to the fact that a more or less
implied code existed and also that the profession is young in this country. The opinions expressed differ considerably as to the code and its need.

The first of the viewpoints is that a definite code is needed which should contain certain concise statements as to the forester's relations with his brothers and to the public in general. This code is modeled more or less on that of the "Code for all engineers" and others, and contains many rules as to fidelity to clients, responsibility to the community and compensation agreements. It was recommended for adoption by the Society of American Foresters, the official organ of foresters in this country. The most convincing argument for this written form is the fact that ideals are crystallized by written documents, thus setting a standard.

The other viewpoint is that the profession of forestry does not need a mass of rules and regulations to keep to the narrow path, as its enemies are not so much those who are practicing real forestry but those without, who seek to discredit the profession. A plea is made for freedom of expression among foresters, unhampered by rules; for discussion without personal bitterness, and for curbing extremists, not by set standards, but by the same action of the majority. The basic and underlying question should be, "Is the work for the public good or against it?" The answer shows whether the action is ethical from the forester's professional viewpoint. No doubt a committee of honor composed of American Foresters of mature age would be of great advantage in upholding the high standards of the profession, but they should be more of an advisory board than a rules and regulation committee.

Among students, the appeal for a definite code is not so apparent. The unwritten code which every college possesses and which we hear expressed as college spirit takes its place, and this spirit acts both as a deterrent and an incentive. Forest clubs of the different schools should engender the spirit of the profession constantly by holding forth that trust, camaraderie and co-operation are the ethics of men of the forestry profession.

It seems to me that I may profitably present to you a written code as it appeared in the current number of the Journal of American Forestry, as follows:

1. The forester, in his professional work, acts as an agent or trustee, and will show fidelity to his clients.
2. He will be faithful to the ideal of a reasonable forest practice, as determined by local conditions.
3. He will inform a client of any business connections, interests or affiliations which might influence his judgment or impair the disinterested quality of his service.
4. For a particular service, he will accept compensation, financial or otherwise, from one source only, and refuse commissions or trade discounts.

5. He should avoid controversy with clients regarding compensation, so far as compatible with self-respect and the forester's right to receive reasonable compensation for his professional services.

6. Forestry is a profession and not a trade, and charges should be based on what the forester considers a just and adequate return for the time spent and the value of the service rendered, rather than on the financial ability of his client.

7. The forester will not associate himself with, or allow the use of his name by, an enterprise of questionable character or one that is working against the best interests of the community.

8. He will not resort to undignified or self-laudatory advertising. He may state briefly the lines of work in which he has had experience, and enumerate responsible positions which he has held and give his references.

9. He will not directly, or indirectly, encroach upon the reputation, prospects, or business of another member of the profession. Ordinarily the inefficient work of another consulting forester should not be criticised unless the client especially calls for this information. Corrupt and unethical conduct in the profession, however, will be exposed by the forester without fear or favor.

10. He will co-operate in upbuilding the forestry profession by exchanging general information and experience with his fellow foresters, and by making available, as soon as practicable, any technical discovery of value to the science of forestry.

These items refer particularly to the consulting forester. However, they are applicable to a forester in any line of the forestry profession.

He will fulfill his responsibility to the community by spreading the knowledge of forest conservation and its underlying principles.

Under this item I have a feeling that the members of the I. A. F. C. have placed before them a real responsibility. In the community from which we came, in the community in which we live and in the community to which we expect to go, whether as professional foresters, businessmen or whatever our daily toil may be, we should keep foremost the idea of forest conservation and its underlying principles. The great reformations which have been made in the ideals or standards or ethics of the human race have been brought about not by
a great armed conflict of stupendous magnitude, but by the quiet, insistent effort of individuals who have a passion to make an ideal life, and that is the history of forest conservation in our country up to the present time. If it is to grow and broaden in the future, the responsibility for making it realize that goal lies with us.

It is a surprise to many forest-trained men to learn thru experience the ignorance of the public generally on forest conservation and the principles which underly. To intelligently inform the public, the forester or the conservationist must not be satisfied with his preparation until he has a thorow working basis of what is meant by conservation. The forest school student frequently has made a broad generalization of conservation, has learned a great deal about the technique of forestry and the science as underlying it, but when it comes to presenting a plausible statement to an inquiring person, he finds himself hopelessly at a loss. In that field, then, it seems to me the I. A. F. C. can very well function in raising a high standard and calling upon all the students in forestry to reach it as a goal.

12. The forester when in public service will be courteous, industrious, impartial and scrupulous. He will resist the misuse or waste of public property. He will not permit violations of the law.

Under this item I wish to say a great deal of what I have to say and then conclude. We have before us in our nation today an outstanding example of the individual who has not been scrupulous and impartial. I need not go into details or call your attention to any specific activity, but simply make references to the oil splattering which is now going on in Washington. Every student has an opportunity sometime during his college career, with rare exceptions, to put into actual practice the principle of courteous and scrupulous dealing upon an impartial basis with his fellows. The matter of student honor is an ideal which develops very closely with the ideal of public honor, business honor and professional honor. The misuse and waste of public property comes very closely to the student life. The buildings, the campus, the equipment of our colleges where we attend school is public property. In moments of excitement, and when we do not take time to think, there is a tendency to misuse or waste this property which is in reality given into our keeping by the tax-payers of the State. The attitude towards this standard of ethics may well be considered by the I. A. F. C.

The last sentence of the 12th principle in this written code strikes me very forcibly. There is hardly a student in the forestry schools who expects to earn a livelihood but that
will be called upon to uphold the law, either in an executive position or the representative of a company or a citizen engaged in private business. The American public must learn that law is law, and the sooner the student learns that law is law the more nearly will the public learn it because we are becoming an educated nation, or I better say the nation is following the lead of the educated men. When I discuss law, I do not refer to blind adoration of an individual whose dictum becomes our mode of action. We want nothing bureaucratic and, by the way, bureaucracy can exist and does exist as much in a private company as in a government. Some of you undoubtedly will be called upon to interpret and administer the regulations of the government or the state by which you are employed. If perchance an irate state senator comes into your office and commences to berate law in general, and particularly the regulations of the Secretary of Agriculture or the State Forester as being partial, and your administration of them as being favorable to the men with money, it will be impossible for you to suddenly rise to a position of a high standard and meet his argument. It is then that the individual is called upon to look back over his life and his student days and review very quickly how he has stood the test of loyalty to law. To put it another way, if I look back over my life and realize that here and there I violated the law, that I winked at violations of the law, that I did not present all the facts in my possession to the prosecuting authority, I cannot then forcefully and conclusively defend the regulation of the Secretary of Agriculture or of any administration of it. Only gradually thruout the years by consistently following a principle of absolute obedience to law and regards for vested authority can any student, or any individual in fact, hope to successfully and impartially administer the regulations of an organization. You may be called upon as the representative of a lumber company scouting over the territory for timber subject to purchase, to face the temptation,—I mean real temptation, and I use the word advisably—of accepting a bribe from the individual desiring to sell a piece of timber to your company. Standards of ethics cannot be made quickly under such conditions.

Again you may be called upon as the representative of a company to face the tax commission and give an honest statement of exact conditions and present your argument to win approval. There is such a thing as the adroit use of words and the withholding of the facts, which while not a violation of the letter of the law are nevertheless a violation of the spirit of the law, and find expression in the term law standard of ethics.
What I mean is that in the student days an individual must commence to build on a firm foundation that standard of ethics in practice by which he intends to be guided in his later years. If his standard is not placed high, he must expect to be guided by a low standard which will unfortunately handicap him from dealing with some of the severe problems he is called upon to solve in later life.

It is so easy in our day to criticize. It is so easy to tear down. It is so easy to work with a small group for special favors. That is common in college life and in life out of college. As was expressed in the article referred to, a high standard of ethics demands that everyone work constructively and not destructively, or work for the common good and not against it. The ideal of the Forest Service is "the greatest good for the greatest number in the long run." Sometimes it is necessary to tear down, but we must never tear down unless we build deeper and broader and higher than before. Nothing is finer in an institution or in life than an individual or group of individuals motivated by a high standard of ethics and continually working for the common good of the community, the state and the nation.

Our profession is judged by each of us just as our school is judged by each of us. Every delegate here today is representing his school. The students of Iowa State College are representing their school. These delegates will go back to their various institutions and rate Iowa State as a fine bunch of fellows or a bunch of roughnecks, or very courteous or not very thoughtful, and a variety of other expressions which I might use; the faculty, the student life and the aims of each of the schools ii is on parade, not literally, and yet in reality each school hour by hour, as we meet here is being paraded before all of us. It seems reasonable to me then for each of us to ask the question, How am I representing my school? and if that does not strike close to the standard of ethics by which I am guided in my thought, my speech and my actions, then I have missed the ideal of this subject.

In the illustration of summer employment, each of you, I think, will catch the significance of my statement. Every student who is employed for the summer takes back to the group his impressions of each of the schools as he got them from the men with whom he came in contact. That is the reason why men change schools frequently because they feel that some other school is better. That conclusion is reached very largely by the impression made in the summer on the part of the student from the other school. I urge upon you then, men, to maintain a high standard of ethics in every field into which you go, and always keep that standard before you.
Lastly, let me say briefly that we are college men. People expect something different from us. That does not mean that we are above anyone else or below anyone else who is sane, sincere, reasonable and charitable. But we are expected to do things differently. Let us do them then and be guided always by a high standard of professional ethics.

AN IDEAL YEARLY PROGRAM FOR A FORESTRY CLUB
Gilbert M. Orr, Washington

Fellow foresters, esteemed faculty members, and friends.

The University of Washington extends to you its warmest greetings, and wishes you the best kind of success in carrying on the greatest forestry convention of forest clubs that has ever been held. We come to co-operate and assist you in every way. In my ideal plan I have copied from certain other institutions as well as our own. In speaking of an Ideal Yearly Program for a Forestry Club, I will have to begin with the very first day which is commonly known as registration day. Two men previously chosen should arrive a day or two early, I say two men, because we want to be certain that one is there.

These men preferably should be upper-classmen and should extend greetings to all the incoming foresters and assist them in every way. They should endeavor to make the newcomers feel at home, and by all means get the new men acquainted with older men of the College. The newcomers should be told of the Forestry Club and its advantages to them. If they desire to become a member collect the dues, and tell them when the meetings are to be held. It might be a little early to collect the dues, but we have found it the best time as all the boys have money at the first of the year. To start things off properly there should be a snappy meeting and smoker the first week, with all the faculty members present, who are best fitted to tell of the activities of the club.

The old members should be prepared to tell of their experiences during the past vacation and bring with them a general atmosphere of friendliness, for the purpose of getting acquainted with the new men. It would be nice to have a peppy orchestra to cheer the boys, followed by some real lively boxing and wrestling matches.

One good stunt if possible, an original one, should be worked up. At this meeting feed the boys some cider and doughnuts and if it is permissible provide smokes and the boys will want to come out to the meetings. This does not
mean that smokes and eats should be provided at every meeting.

Two weeks from the first meeting there should be a camp fire meeting or barbecue where some good fresh roasted weiners, baked beans, buns, hot coffee and plenty of juicy red apples can be had and also some good yarns told by the experienced men of the club. The frosh should be initiated at this meeting, and if you have a forest club pin put it on them and let them know that they have become one of the bunch, in name, if not in experience. Washington has a little pin which is the cross section of a log and it is a very unique emblem, our foresters are proud to wear it. The meetings for an ideal yearly program should be held every two weeks or twice a month. Our meetings are held every other Wednesday from 7:30 to 10 o'clock. Occasionally the orchestra opens the program, followed by the business meeting which includes committee reports and appointing men on the various committees. The following committees may be filled: the Program Committee, Social Committee, Pin Committee, and the Frosh Vigilance Committee, Yell leader for the all-university assemblies etc. The executives of the club should aim to get the co-operation of every member in the club by getting them to participate in some activity in the club. The principle speaker of the evening delivers his address. The speakers should be obtained from the many fields of forestry such as Forest Service officials—national park officials—logging engineers—logging superintendents—milling and marketing experts—shingle manufacturers—wood pulp experts—wood preservation experts and occasionally speakers on allied subjects such as Geology, Botany, Forestry Pathology. Many of these lectures should be illustrated with movies or slides when available. The meetings of an ideal yearly program should adjourn with songs or yells. It often adds to the pep of the meetings to give a yell for the principle speakers, and it certainly makes them feel good. In thanking a speaker it is well for the club's members to rise, this also has its effect upon the speaker, and he will invariably carry away a good impression of the club. In order to get a large turnout of the club members, all meetings should be properly announced in the college paper, publications, or on the bulletin board.

Our College of Forestry School year is divided into three quarters, the autumn, winter, and spring; and each quarter of the ideal yearly program should have a big social event. During the winter quarter the short course men assemble from the woods and are greeted at a big Forester's Banquet which is well attended by the alumni.
In the spring quarter it might be a good idea to hold a big annual hcedown, dance and picnic. Forest Club trips should be encouraged to points of interest where the students may study the whole field of forestry from the pebbles along the road to the sustained yield system of Forest Management.

Every other year the foresters of Washington in co-operation with the engineers put on a big open house in the Spring quarter, showing the various lines of work carried on by each college, demonstrated with miniature exhibits and laboratory specimens previously collected in the field, for Dendrology, Technology, and Pathology. There were from ten to fifteen thousand visitors at the last open house. The foresters are to be commended for their success, as they have always won first place with the exception of one year, and that was at the beginning of the world war when the chemists tied us for the first honor. The competition this year will be very keen.

One of the main activities of an ideal yearly program should be the publication of a Forest Club annual or quarterly. The publication would provide a valuable business and editorial experience for the club members. It would have a great deal to do with bringing the leaders and practical man of the industry into closer touch with the younger men of the profession. The articles should be of a technical nature, and of a variety such as in the Gopher Pevy, an annual put out by the University of Minnesota.

The articles should be written by men high up in the profession, and by faculty members, who specialize along particular lines and last but not least, original research articles by the students themselves. Photographs of the club should be taken each year for the annual publications of the colleges or University.

In an ideal yearly program it might be well to have a picture album located in Forestry College library, showing pictures of the boys at work during the summer. It would be a good idea to keep a scrap-book in the library which would tell of the success of the foresters in the various activities in the college and field.

The club should encourage athletics and if it is possible organize teams, for there is nothing so thrilling as competition.

In the all university assemblies a special reserved section should be set aside for the foresters, where they may sit together in a body and give their yells. In an ideal yearly program the foresters should always aim for co-operation with a desire to hang together like a happy family.
Yale has an alumni advisor elected according to regular constitution manner. The Alumni Advisory Board is very active. They are elected to serve for a term of years meeting at regular intervals, and representing the alumni in the activities of the academic year. It seems to me it might also well be the Senior Advisory Board. It would make their college mean more and the campus mean more to the state and more to the forestry profession.

As a theoretical illustration: One man gets in touch with another man during summer employment. He thinks in some other school they are offering something which he doesn't have. Is there any reason why those comparisons should not be capitalized to the value of the school?

Clark: (Minn.): I would like to say a word regarding the Faculty or alumni members of the Forestry Club. There may be a time when for the assistance of your club you will need money from your alumni members. We are appreciating that this year. And as a fellow says, the way to get money out of a man is to feed him first. Feed them stuff that you are going in the right channels. We put it up to our alumni this year to help us out. They wanted to know why we were in the hole.

The fellows who come in this year or year after may be a good bunch and have a lot of pep and next year they might be a dead bunch and let things go to pieces and there would be a lot of debts contracted.

The alumni members or a committee can take care of such things as that. They could watch the club closely and tell when they are going behind.

Orr (Washington): What authority does the Alumni Advisory Board have in the club other than looking after the finances? This is a very touching and vital subject which you have brought up and I have appreciated it. I want to know what authority you are going to give that Alumni Board.

Jeffers (Yale): It seems to me that any Forestry Club might suggest to the department the Alumni Advisory Board and provide for its continuance through election every year. The Alumni Advisory Board should be so selected that the members can get together. By correspondence with the club or Head of Department they may suggest concerning policies, changes in the courses of study, better schemes of putting the school before possible Forestry students. The Alumni would work in the school in different ways than the students in the school and also differently from the faculty. Their viewpoint ought to be made effective in some way.
The Senior Advisory Board might give the sum total of the experience of the students. An example may suffice. "During the 3 years I have been in this school (I. S. C.), I have been out during the summer time and met other Forestry students. Some feel they are poorly equipped for telephone engineering. Others feel very well equipped in mensuration. Other men knew what silvicultural terms meant. Other men knew the names of the trees and characteristics of them and I had to learn them. Let the teaching staff get the advantage of it. Because as alumni, fellows, the school made a contribution to our life, gave us something."

I think there may be room for something of that sort in every school and would like to have the viewpoint of the delegates.

The Constitution of the International Association of Forestry Clubs
(As amended at Ames, Iowa, March 8, 1924).

ARTICLE I Name.
The name of this organization shall be, "The International Association of Forestry Clubs."

ARTICLE II Object.
The object of this association shall be to create interest in scientific forestry, and to encourage good fellowship among the students of the different forestry schools.

ARTICLE III Membership.
Section 1. Any forestry club of a professional forestry school shall be eligible for membership in this association upon approval of every member club of the association.

Section 2. Any forestry club desiring membership in this association will submit their application in written form to the president of the president club three months prior to the convention.

Section 3. Approved forestry club to have full membership upon payment of the initiation fee to the Treasurer of the Association.

ARTICLE IV Officers.
Section 1. The officers of the Association shall be:
a. President, elected from the President Club.
b. Vice-presidents, one elected from each club.
c. Secretary and Treasurer, elected from the President Club.
ARTICLE V  Duties of Officers.

Section 1. The duties of the president shall be:
   a. To preside at all meetings of the Association.
   b. To appoint committees.
   c. To notify the secretary of all meetings so that he may send out notices of the same.
   d. To receive and forward all material of the association that is intended for publication.
   e. To circulate applicants' petitions for membership in this association, among the member clubs for approval.
   f. To perform all other duties executive or otherwise that necessity calls for.

Section 2. The duties of the Vice-president shall be:
   a. To act as representative of the local club.
   b. To notify the president of the association of his election.
   c. To compile a report of the activities of the club and send the same before May 1st each year to the Secretary and Treasurer of the Association.
   d. The Vice-president of the president club shall preside at meetings in the absence of the president of the association.
   e. In event of the absence of both the president of the association and vice-president of the president club, the presiding officer shall be the vice-president of the association representing the club of the school of which the meeting is held.

Section 3. The duties of the Secretary-Treasurer shall be:
   a. To keep the minutes of all meetings of the association and to conduct all correspondence relative to the business of the association.
   b. To receive and have custody of all money paid to the Association.
   c. To keep a careful record of all receipts and expenditures and to notify each club of its financial standing in the Association.
   d. To make a report at each meeting and to send, before November 1st of each year, newsletters consisting of a record of the activities of each club.

The President Club shall be elected at each meeting by

ARTICLE VI  Election of President Club.

a majority of votes cast by delegates and by proxy at the meeting. (At the 1924 meeting the election was delayed
until 1926 when the club which is now president will initiate action among the member clubs leading to the election of the president club for 1927).

**ARTICLE VII  Election of Officers.**

Section 1. The President of the Association shall be elected by the President Club at the first meeting of that club held after the meeting of the Association.

Section 2. The Vice-presidents of the Association shall be elected by their respective clubs at the first meeting of the clubs after the last meeting of the Association.

Section 3. The Secretary-treasurer of the Association shall be elected by the President Club at the first meeting of that club after the last meeting of the Association.

**ARTICLE VIII  Tenure of Office.**

Elected officers to hold office until the next meeting of the Association has been held.

**ARTICLE IX  Privileges of Membership.**

Each club upon payment of all money due the Association shall be entitled to one vote either by delegate or proxy, on any subject which may properly come before the meeting. A majority vote rules.

**ARTICLE X  Meetings.**

Section 1. National Meetings.

a. To be held every third year. The policy of the Association shall be to alternate meetings between East and West.

b. The time and place of meetings is to be left to the discretion of the President of the Association.

Section 2. Sectional Meetings.

a. Consisting of three or more clubs may be held annually if they so desire. Proceedings of the minutes to be forwarded to each member club of the I. A. F. C.

**ARTICLE XI  Dues.**

Section 1. An initiation fee of $5.00 shall be paid to the Secretary-Treasurer.

Section 2. Each club shall pay $4.00 annual dues.

**ARTICLE XII  Amendments.**

This constitution may be amended by a three-quarters vote of the clubs represented at the meeting.
Our Alumni

D. Nelson

1904

Merritt, M. L. After finishing at the Iowa State College, Merritt spent about 3 years in forestry work in the Philippine Islands, later returning to the United States where he re-entered government forestry work. At present he is Assistant District Forester of the Alaska District which comprises approximately 20 million acres of National Forests.

1907

Balthis, R. F. On graduation Balthis entered government forestry work and for a number of years was Forest Supervisor in charge of one of the National Forests in the west. At present he is in private business in Colorado. Address: Green Mountain Falls, Colo.

Kupfer, Carl A. Entered government forestry work and was engaged in forest products work with the U. S. Forest Service. More recently was in charge of the branch of forest products with headquarters at San Francisco. At present he is a California representative for the North Coast Dry Kiln Company. Address: 811 Santa Barbara Road, Berkeley, Calif.

1908

Baxter, W. F. After completing forestry work at the Iowa State College, Baxter took additional work at another institution. For a number of years he was employed in government forestry work. At present he is farming at Galva, Iowa.

Haeffner, H. E. Entered government forestry work soon after graduation and has continued in this work to the present time. Is now Forest Examiner of the Siskiyou National Forest in Oregon, Grants Pass, Oregon.

1909

Allen, Shirley W. After graduation Allen entered government forestry work in the west, was later transferred to the U. S. Forest Products Laboratory at Madison, Wisconsin, where he worked for several years. Later was made Forest Supervisor of the Angeles National Forest in California. He resigned this position to take a position with a lumber company and at present is in private business.

1911

Barrett, R. L. Since graduation Barrett has been employed as manager of a large orchard company with headquarters at Koshkonong, Missouri.

Freeman, F. G. Engaged in fruit business at Santa Ana, California.
Hoffman, A. F. C. Entered government forestry work upon graduation. In a few years worked up to the position of Forest Supervisor and at present is Supervisor of the Monte- tezuma National Forest in Colorado which comprises an area of approximately one million acres. Address: Mancos, Colo.

Parke, L. S. For one and one-half years after graduation was Agricultural Inspector for the U. S. Reclamation Service, Phoenix, Arizona. For five and one-half years State Director of club work, University of Arizona, for two years Instructor in Vocational Agriculture at Benson and Chandler, Arizona. He is located at the latter place at this time.

Smith, P. T. On leaving college he entered government forestry work and for a number of years was employed on the Black Hills National Forest in South Dakota. At this place he worked up to the position of Deputy Forest Supervisor but later accepted a position as county agent in South Dakota, which position he now holds. Address: Redfield, S. D.

Reynoldson, L. A. Soon after graduation he accepted a position with the U. S. Department of Agriculture. This work was continued for several years. Present position is not known.

Whitham, J. C. On finishing college he took the Civil Service examination for government forestry work, entered government employ at once and has been in continuous government service since that time. At present he is Supervisor of the Custer National Forest at Miles City, Montana.

1912

Lessel, L. R. Entered Forestry work in the employ of the Government at once after graduation. At present he holds the position of National Forest Examiner, located on the Sitgreaves National Forest at Holbrook, Arizona.

O'Banion, A. C. For a number of years after finishing the Forestry course, he taught in a high school in Minnesota. At present he is County Agent at Park Rapids, Minnesota.

Olmsted, R. A. At present time he is in charge of a prune and walnut ranch at Dundee, Oregon.

Richmond, H. M. Entered government employ upon graduation on the Minnesota National Forest. Later transferred to the Arapaho National Forest in Colorado as Forest Examiner. At present he is in private business at Cass Lake, Minnesota.

Smith, W. A. Accepted a position in government forestry work on finishing college. He continued in government work for several years but at present is in private work.
Truax, T. R.  After finishing Forestry course, was employed as Instructor and Assistant Professor for a number of years in the Forestry Department at the Iowa State College. At the entrance of United States into the war, he accepted a temporary assignment at the U. S. Forest Products Laboratory at Madison, Wisconsin, where he has remained since that time. He is now engaged in investigative work with that laboratory.

1913

Baxter, L. J.  On graduation he did not take up professional Forestry work. At present he is on a large farm at Galva, Iowa, where he has assisted our Extension Forester in putting on demonstrations for the farmers of his locality.

Clark, H. B.  Mr. Clark did not enter professional Forestry work on graduation. For several years was connected with an insurance company at Sioux City, Iowa. At present he is President and Manager of the Sioux-White Motor Company of that place.

Hensel, R. L.  On leaving college, Mr. Hensel accepted a government position connected with range management on the National Forest. He continued in this government work for a number of years and later accepted a position as Professor of Range Management at the Kansas Agricultural College at Manhattan.

Ringheim, H. L.  On leaving college Mr. Ringheim accepted a position with a lumber company in Saskatchewan, Canada, where he has been employed since that time. At present he is Traveling Superintendent of the Monarch Lumber Company at Elrose, Saskatchewan, Canada.

Steffen, E. H.  Entered government forestry work immediately after graduation. Spent several years on grazing investigations on National Forests in the northwestern part of the country. Since about 1919 has been head of the Department of Forestry, State College of Washington at Pullman, Washington.

Watts, L. F.  Entered Government Forestry work in the west after finishing the Forestry course. Has continued in the employ of the U. S. Forest Service since that time. At present is Forest Supervisor in charge of the Idaho National Forest of about one one million acres, located at McCall, Idaho.

1914

Hassel, W. C.  Employed in government forestry work in Minnesota and the west for a number of years after graduation. At present he is Superintendent of Schools at Salem, Iowa.
Hayes, R. W. Soon after finishing the Iowa State College, Hayes accepted a forestry position with the U. S. Indian Service. For a number of years he has been Forest Supervisor of that service. Later, for a short period, was with a lumber company but at present holds the position as Logging Engineer at large for the Indian Service in the southwest, with headquarters at Albuquerque, New Mexico.

Nagel, W. M. Entered government work at Missoula, Montana on graduation. Was engaged in reforestation work for several years. Later assigned to the Bitter Root National Forest. At present Forest Examiner of the Bitter Root National Forest in Montana, Hamilton, Montana.

Schreck, R. G. Passed the Civil Service examination for the U. S. Civil Service upon graduation. Spent several years as Forest Assistant and Examiner on the Superior National Forest in northern Minnesota. Since about 1918 he has been Forest Supervisor of the Michigan National Forest at East Tawas, Michigan.

Sterrett, J. C. Entered the lumber business when he finished school. It is understood that he has been in lumbering and house building business since that time.

Van Boskirk, S. S. Accepted a government position when finishing the Forestry course. Was engaged in National Forest work in the southwest for several years. Later was assigned to one of the Forest Experiment Stations in Utah. At present is Deputy Forest Supervisor of the Manti National Forest with headquarters at Ephriam, Utah.

Wolven, R. M. Did not enter professional forestry work when he finished college but went into private business and it is thought is now located in California. Newport Road, Santa Ana, Calif.

Wolf, E. T. Entered employment of the U. S. Forest Service on completion of Forestry course. For several years was engaged in timber reconnaissance work in District 1 of the Forest Service in Colorado. At present is Deputy Forest Supervisor of the Lolo National Forest at Missoula, Montana.

Bode, I. T. For several years after graduation was in charge of the Kansas State Forest Nursery at Hays, Kansas. Later, was employed as Instructor in the Forestry Department of the Iowa State College which position he held until transferred to the position of Extension Associate Professor of Forestry. He is now engaged in developing the forestry work among the farmers of Iowa.
Hansel, H. E.  Mr. Hansel did not undertake professional forestry work upon graduation but accepted a position in the county engineer's office at Bloomfield, Iowa. At present he is County Engineer and also consulting Drainage Engineer, at that place.

Harley, Wm. P.  Soon after graduation Harley accepted a Forestry position with the U. S. Indian Service and has been connected with this department since that time. At present he is Deputy Supervisor of the Indian Service located at Dulce, New Mexico.

Hicks, L. E.  For several years Mr. Hicks was employed in government forestry work in the west but resigned to take up private business at Detroit, Michigan, where he is engaged at the present time.

Smith, R. P.  Undertook teaching work upon finishing college and is engaged in this work so far as is known at the present time.

1916

Cassidy, H. O.  Entered the work of the U. S. Forest Service upon graduation. Has specialized in grazing investigative work in the southwest. Now has the position of Grazing Examiner of the Forest Service, located at district headquarters at Albuquerque, New Mexico.

Cornell, H. H.  After finishing the Forestry course at the Iowa State College, Mr. Cornell took graduate work in Landscape Architecture at Harvard University, after which he returned to the Iowa State College as Landscape Extension Specialist for the Landscape Architecture Department. He has continued in this position until Feb. 1, 1924. At present he is engaged in private landscape architecture work.

Geisler, Max.  Was engaged in investigative work with the U. S. Forest Service until the United States became involved in the war and due to the fact that he did not have his final citizen's papers, found it necessary to leave the government service. At present he is President and Manager of an auto tire company in Chicago. Address: 2216 So. Michigan Ave., Chicago, Ill.

Jones, G. C.  Jones did not enter professional forestry work upon graduation but accepted a position with an insurance company and is engaged in that work so far as is known, at this time. 715 Hippee Bldg., Des Moines, 1a.

Quint, H. J.  After leaving the Iowa State College, he accepted a position with a lumber company on tie inspection work. Last report indicates that he is still in the employ of a lumber company.
Plagge, H. H. After graduation, took up Pomology work and at present is employed as Assistant in Pomology in the Horticultural Section at the Iowa State College.

Plagge, N. C. Entered private business upon graduation. He is located at Barrington, Illinois.

McCarthy, C. C. At present in private work located at Ames, Iowa.

Rumbaugh, W. R. After graduation was employed with the Davy Tree Surgery Company, later with the P. S. Phelps Tree Surgery Company, later was connected with the F. A. Robinson Landscape Company of Des Moines, Iowa, and resigned this position to take employment with the Everett Nursery Company of Chicago. At present is looking after farming interests at Collins, Iowa.


1917

Hartman, G. B. After returning from service in France, Mr. Hartman was employed with the Long-bell Lumber Company of DeRidder, Louisiana. At present he is Plant Superintendent for that company at the same location.

Henry, Allen S. For several years after graduation was in charge of the Pole and Timber Preservation Work of the Northwestern Bell Telephone Company with district headquarters at Omaha, Nebraska. Recently resigned this position to go into private business. 419 6th St., Sioux City, Ia.

Veach, C. H. After graduation he was engaged in landscape architecture work in Iowa. At present he is teaching in a high school at Park River, North Dakota.

1918

Davis, E. M. For a short period after graduation was employed as an Inspector and Foreman of a creosoting plant of Eppinger and Russell Company. Later was employed as Tie Inspector for the Erie Railroad in the east. For a short period employed by the Thomas A. Edison Company as an Inspector and later accepted a position with the Long-bell Lumber Company in Louisiana. At present is employed at U. S. Forest Products Laboratory, Madison, Wisconsin as Assistant Wood Technologist in the Section of Industrial Investigations.
Hadlock, F. D. On leaving Iowa State College, Hadlock was employed as tie buyer for the Western Tie and Timber Company. Later resigned to accept a position as Development Engineer of the Western Electric Company where he now has charge of the dry kiln operations of that company. Took M. F. Degree June, 1923. 4748 N. Springfield Ave., Chicago, Ill.

Rehmann, T. W. Mr. Rehmann did not enter professional forestry work when finishing college. He is at present located at Des Moines, Iowa, in the real estate and house building business. 431 Flynn Bldg., Des Moines, Ia.

Poshusta, D. C. At present he is employed with the Long-bell Lumber Company at Shreveport, Louisiana.

1919

1920

Deming, Milo H. On graduation Mr. Deming was appointed as Grazing Assistant of the U. S. Forest Service. At present he is Grazing Assistant at the district office of the Forest Service at Ogden, Utah.

Fletcher, R. A. Accepted a position with the U. S. Forest Service in northern Idaho and later resigned to take a position with a forest products company in the same state. At present is employed by the Hammond Lumber Company at Samoa, California.

Hoyer, V. B. After finishing his college course he was engaged in the retail lumber business at Ida Grove, Iowa. About a year ago he accepted a teaching and coaching position in the high school at Roseau, Minnesota.

Moorhead, John W. Entered lumber business after finishing college. At present employed with a lumber company in California.


Wall, L. A. After finishing the Forestry course was employed as Grazing Assistant in the west, later returned to the Iowa State College to complete work for the Master's Degree. At present located at the District Forester's office at Ogden, Utah in the capacity of Grazing Assistant for that district.
Loy, E. C. After graduation he entered teaching work. At present is a high school teacher at Omaha, Nebr. Address: 4516 N. 39th St., Omaha.

1921

Avery, N. A. Entered U. S. Forest Service at the completion of his college course. At present employed in government work in the Colorado-Wyoming-South Dakota region.

Cormany, C. P. Employed as salesman of the Weyerhaeuser Lumber Company of Chicago. Present position Assistant to District Manager of that company.

Fisk, V. C. For one or two years after graduation was employed by the State Forester of Illinois on investigative work. At present is in lumber business at Pecatonica, Ill.

Helm, H. J. Since graduation has been employed in the U. S. Forest Service as grazing assistant. At present is located at district headquarters at Ogden, Utah.

Ling, Wen Ming. After completing an additional year of graduate forestry work he accepted a position as Superintendent of the Industrial Mission at Pagoda Anchorage, Foochow, China, where he is engaged at present.

Patrick, O. K. Was employed by the Long-bell Lumber Co. after graduation. At present in charge of creosoting work at one of the Long-bell Lumber Company's plants in Louisiana. Address: DeRidder, La., in care of above company.

Munson, H. F. After graduation was employed as Superintendent of a creosoting plant in the east. Later employed in Washington State by the Weyerhaeuser Lumber Company. At present is Assistant Professor of Forestry at the State Agricultural College, State College, Texas.

1922

Eggers, Wm. C. Has been employed with the Long-bell Lumber Company at Shreveport, Louisiana, since graduation. At present is superintendent of one of the creosoting plants of that company.

Fennell, Robert E. Employed as Graduate Fellow in the Botany Department, Iowa State College, at the present time.

Moravets, F. L. Accepted a position in government forestry work on completion of college course. At present located at the district headquarters at Portland, Oregon.
Morris, R. D. Since graduation has been employed as Grazing Assistant in District 3 of the U. S. Forest Service where he is engaged at this time. Santa Fe, N. M.

Pohle, E. W. Since graduation he has accepted a Fellowship in the Forestry Department of the University of California where he is located at this time. Berkeley.

1923

Bogen, A. J. After completing his college course in Forestry, Bogen accepted a position with the Des Moines Sawmill Company at Des Moines, Iowa, where he is located at the present time.

Dunn, Paul M. Dunn accepted a teaching Fellowship in the Forestry Department at the Iowa State College immediately after graduation, in order to permit him to complete work for a Master's Degree in this line.

Trenk, Fred B. Accepted a position as Graduate Assistant in the Botany Department of the Iowa State College, immediately after graduation.

Watkins, E W. Watkins accepted a Research Fellowship in the Forestry Department during the present year in order to permit him to complete work for a Master's Degree in Forestry.

Prout, C. W. Prout completed his college work in December 1923 and at that time accepted a position in connection with Boy's work in the city of Chicago where he is located at the present time. Address: 1838 W. Division St., Chicago, Ill.

Other Students

In addition to the above students who are graduates in Forestry, a large number of students have completed from one quarter's work to three and one-half years in the Forestry course. Many of these students are engaged in professional work but no attempt was made to list these men along with the graduates.
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