Steps of Progress in Michigan Forestry

Michigan Forestry Commission

CHAS. W. GARFIELD, President
Grand Rapids

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Letter of Transmittal.

To Hon. Aaron T. Bliss, *Governor of Michigan:*

Sir—I have the honor to submit herewith, in accordance with legal requisition, a brief report of the activities of the Michigan Forestry Commission with accompanying papers, for the year 1901.

Yours respectfully,

CHAS. W. GARFIELD,

President Michigan Forestry Commission.

Grand Rapids, Mich., December 31, 1901.

Annual Report of the Commission.

To His Excellency, Aaron T. Bliss, *Governor of Michigan:*

Sir—Act 227 of the Public Acts of 1899, approved June 7, 1899, provides for the organization of the Michigan Forestry Commission, and a provision of this act requires from the Commission an annual report to the Governor.

The fact that there is no session of the legislature this winter is our excuse for not making a very full report of the correspondence and papers which have been written upon the subject of forestry in our State during the year, but we desire to keep you informed with regard to our movements, and through you to let the public know of the progress made in the development of public interest in the work which the legislature gave the Commission to perform.

The last session of the Michigan legislature did not broaden the work of the Commission nor give it any additional power or authority, so we are still in the epoch of agitation and education, with the principal duty upon us of disseminating information by addresses and lectures, by communications to the press and discussions before public bodies of the facts connected with the forestry problem in Michigan, having the hope constantly before us that in the near future a plan will be evolved which can be prosecuted earnestly in the interest of maintaining the standing of our commonwealth as a lumbering as well as an agricultural state. The legislature, by concurrent resolution, turned over to the Forestry Commission fifty-seven thousand acres of land in Roscommon and Crawford counties as a nucleus for a future forestry preserve to be located about the sources of the great rivers that rise in this part of the State. This action of the legislature was based upon the recommendation of the Commission that the most promising locality in which to build up a permanent forest and game preserve is in that region in which the Muskegon, Manistee, Big Thunder, Au Sable and Titabawassee rivers find their sources, and includes portions of Roscommon, Crawford, Kalkaska and Clare counties. While prosecuting the general purposes of the Commission it seemed wise to centralize our efforts upon some definite plan for the future at as early a date as possible, and this was the most promising place to work.

Immediately after the concurrent resolution above mentioned became operative, the Commission began to investigate the conditions and possibilities of the region in which this area of land lies. After some correspondence with the Forestry Bureau of the United States government by members of the Commission, a promise was given by the bureau to render us such help as it could in our initial investigation. Mr. T. H. Sherrard, an expert from the bureau, was detailed to spend some time in Roscommon county and vicinity, make observations and advise the Commission as to the promises for the future of a vast area of country of which these lands turned over to the Forestry Commission were a type.

Mr. Sherrard gave notice of the date he could come into the State, and the Commission arranged with Mr. F. E. Skeels to be his guide and render every assistance possible in making the most of his sojourn in the State. Some time was spent in a hasty review of the situation, after which a party was formed, consisting of Mr. Sherrard, Mr. Skeels, Secretary Wildey of the Commission, Prof. Chas. A. Davis of Ann Arbor, and several other gentlemen including a newspaper correspondent, to make a tour of the region in which this preserve was located. The surveying party spent a number of days and covered a wide range of territory about Houghton and Higgins lakes, and became quite familiar with the forest conditions of the country. A full report of the trip will be given in our final report to the next legislature. Suffice it to say in this letter to you, that the party was impressed from the outset with the fact that there was so small a proportion of agricultural lands in this locality, and such a vast area that had been swept over by forest fires from time to time, presenting to them a disheartening situation. However, the party found in many localities, in which recent fires had not done their ugly work, a very good stand of young and promising timber. They became satisfied that there were great possibilities in this region if the seeds of proper timber trees could only be scattered and given a chance to germinate and grow. The kind of timber did not seem to vary with the soil so much as with the accident of seeding. Wherever there were seed trees of red oak there would be, for a considerable surrounding area, a fine growth of this timber coming on. The same was true of the white oak and black oak, white pine, Norway pine and jack pine. These features emphasized in their minds the possibilities of the region for forestry purposes. The measurements taken of some of the young timber and computations concerning the time of the growth were very encouraging.

While upon the very poorest lands the outlook was not so promising, yet upon many of the thinnest lands, where the hand of man had assisted nature a little, there was a promise, providing some method could be devised to protect from fire at a minimum expense, that the State could secure within a generation results that would warrant it in taking hold of the problem of reforestation under a systematic and economical method.

As a result of this investigation, the Commission is more strongly impressed than ever with the fact that this country under consideration is not an agricultural region. There are some good lands on which farming could be prosecuted successfully, but these lands form but a small fraction of the entire area; and inasmuch as the State, in one way or another, comes into possession of a very large proportion of these lands, it would seem to be a matter of wisdom to investigate the question of reforestation very thoroughly and determine as to the expediency of utilizing these lands for the growing of a permanent forest cover that shall remain forever as a forest domain.

There is a growing conviction among the people who have been most thoughtful about the future of our State, that the method which has been pursued of inducing people to go on poor lands simply because they are cheap, is a mistaken one as a matter of State policy, and an injustice to immigrants. A wiser plan would be for the State to cover the thin lands with a forest growth that shall be of permanent benefit to contiguous agricultural lands, and aid in every way the farmer to a more intensive method of farming the better lands.

In the course of another year the Commission will probably be able to obtain a wider array of facts and figures to establish its contention that this is the locality for a large and permanent State forestry preserve. In connection with this main idea, the Commission has had called to its attention in various ways the desirability of utilizing the same region as a game preserve, for the purpose of perpetuating within our borders the more useful of our animals which made their home in our peninsula under the primitive conditions of our State.

The Commission is glad to announce to you that in the annual report of Mr. Gifford Pinchot, the government forester, we have the promise of continued help from his bureau in the investigation which was so satisfactorily inaugurated during the past year. As a result of this valuable assistance, we hope to give to the next legislature very clearly-defined ideas with regard to the future management of a considerable portion of the lands which have reverted to the State as a result of delinquency in the payment of taxes.

During this year the Commission expects to put in proper shape its recommendation with reference to solidifying a permanent forestry reserve in the region which we have been investigating, by placing in it all lands owned by the State that are contiguous to the ones already turned over to the Commission, and by securing original deeds from a large number of parties who may have some claims upon this land, that has come into the possession of the State as a result of a delinquency in the payment of taxes.

Aside from the study of the matter of a permanent forestry preserve, as indicated above, the Commission made, at different times, a showing of the importance of the great forestry problem as connected with the leading educational institutions of the State, urging the duty of the University and Agricultural College to take up the problem. As a result of importunity and a responsive audience on the part of the Regents of the University and the Board of Agriculture, a department of forestry has been organized in the State University, and an assistant professorship provided for in its faculty. Prof. Charles A. Davis has been appointed to fill this chair, and is already working in harmony with the Commission. The State Board of Agriculture has also established a similar department in the Michigan Agricultural College, and has set aside 3,000 acres of fine hardwood land as a laboratory for technical forestry study in connection with the scheme of education which shall be arranged. The Department of Public Instruction has also taken up the work at the suggestion of the For-

estry Commission, and in many counties the duty of educating people in forestry matters has been prosecuted with vigor and success.

The women's clubs of Michigan have taken up the subject of forestry as a topic in their regular schedules for discussion, and in a good many instances very valuable papers upon the subject have been written and published, exhibiting thereby an interest in the work of the Commission that is encouraging and highly satisfactory.

At the suggestion of the Commission, Prof. C. D. Smith, superintendent of farmers' institutes in Michigan, inducted into his plan for 1901-2 a technical work along forestry lines, to be carried out in each one of the farmers' institutes in the State. The members of the Commission, Mr. F. E. Skeels, Prof. C. A. Davis and Prof. Spaulding, together with some of the professors at the Agricultural College, have rendered valuable assistance by leading discussions at these institutes upon subjects connected with forestry. Everywhere these discussions have been well received, and there has been great interest shown. The Commission has been called upon for pamphlets, documents and reports that give statistical information, but we are unfortunate in having a very limited number of our reports, and we have exhausted all other documents in our hands for distribution. It is the hope of the Commission during the year 1902 to gather some very effective statistics from within our own borders to use in impressing the people with regard to the rapid growth of timber, and the promise that lies in the growth of a timber lot as an adjunct to the farm. We also hope to get exact information as to the serious loss to agriculture in Michigan, which has resulted from cutting off so large a portion of the forest cover.

In connection with the publication of the numerous articles upon that vast region which has been spoken of as the "jack pine barrens," there have been very many things stated which have created wrong impressions in the minds of the people with regard to the purposes of the Commission. We hope in the future to rectify these false interpretations of our purpose, and prove that while our methods may be open to criticism, we are in earnest in our desire to utilize the poorest lands of the State so that they will be of the largest possible benefit to the future of our commonwealth. The Commission has never maintained that all the lands in the vicinity of the jack pine plains were valueless for agriculture, but it has contended that the agriculture carried on upon such lands as are adapted to these purposes would be more productive if the non-agricultural lands could be successfully handled under a forest cover.

The Commission has become satisfied that most of the large fortunes of the State have been made out of the value in the virgin forest, and it has conceived the hope that as a result of the investigation we are carrying forward, and the information we have been able to obtain with regard to the needs of the State, some of these men who have become wealthy out of forest products would take up the matter of reforestation on

some of our poorest lands, and set an example of economical management that would be helpful to individuals and to the State. Our work must of necessity be very slow, because we can go no faster than popular intelligence is awakened on forestry matters. It would be perfectly feasible for some public-spirited citizens to set aside an endowment fund to cover the continuous expenses of, and to manage a considerable tract of cut-over lands after the most approved forestry methods, which have been evolved by a long period of experience in other countries, and thus help the Commission more effectively than by any other means.

The Commission is happy to learn that there seems to be a desire on the part of some of our wealthy citizens, whose fortunes have been cut from Michigan's forest heritage, and who are mindful of the future of the State, to take hold of the investigation of forestry methods in foreign lands and make a practical application of the ideas that will be most promising in the prosecution of the work within our borders. The Commission hopes that this thought will materialize into an active movement for carrying on a useful and successful investigation. In this connection the Commission is happy to learn that an ex-governor of our State, who has been interested in the problem of reforestation, has suggested that the State of Michigan should select from its citizenship men who would be willing to enter upon an investigation of foreign methods of reforestation, at their own expense, having in view a more successful prosecution of the work in our own State. In the interest of the work we are trying to do, the members of our Commission earnestly desire that you will, as executive of the State, take this matter up immediately and by virtue of the authority which is in your hands act upon this suggestion, which has come from one of our most public-spirited citizens, and make a selection of a commission for investigation, with the authority of the State behind it, to report possibly something of immediate value that shall aid the next legislature in promoting a far-reaching plan of reforestation for our State. The Commission is grateful to the executive of the State for the kind words he has uttered in connection with the work it is carrying on, and it is glad to say in this connection that the departments of State which are now under the direction of the Auditor General and Commissioner of Land Office—the departments which are most interested in lands which shall be used for forestry purposes in the State—are working harmoniously with the Commission and assisting the members in their efforts to do the wisest thing for the State in the management of its wide area of lands that eventually should be covered with forest growth.

The Commission desires to make one suggestion, that can be carried out in the near future, if it meets with your approbation, and which it seems to us will be effective in awakening a great interest in our work among the children; we refer to the matter of educating the children in their Arbor Day exercises with reference to the beneficial influences of forests upon agriculture and horticulture, as well as giving practical

lessons with regard to trees and tree-planting. This you can materially aid through your annual proclamation. The farther the investigation of the Commission reaches, the more deeply it becomes interested in the subject, and the more promising seem the results of a well-developed forestry policy, not only in maintaining the attributes of our State that make for wealth, but in adding to the value of our domain as a place for the establishment of ideal homes.

Respectfully submitted,

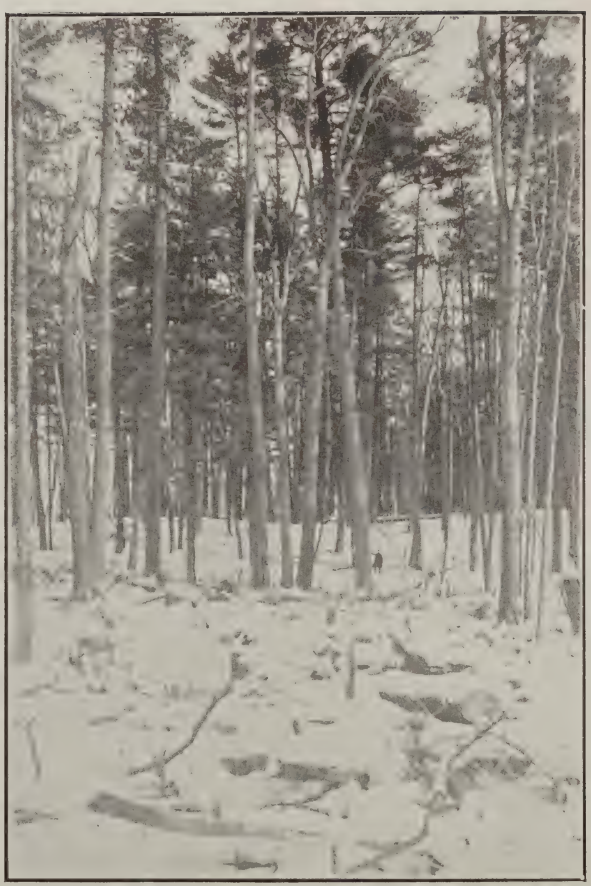
ARTHUR HILL,
EDWIN A. WILDEY,
CHAS. W. GARFIELD,
Michigan Forestry Commission.

The object of forestry is to discover and apply the principles according to which forests are best managed. . . . The forest is as beautiful as it is useful. The old fairy tales which spoke of it as a terrible place are wrong. No one can really know the forest without feeling the gentle influence of one of the kindliest and strongest parts of nature. From every point of view it is one of the most helpful friends of man. Perhaps no other natural agent has done so much for the human race and has been so recklessly used and so little understood.

—Gifford Pinchot.

The magnificent forests of Michigan were a blessed heritage from the hand of God. The ruthless destruction of them, by the thoughtless hand of man, has brought upon us conditions which have reduced our productive power, and taken from our fair peninsula her most enchanting beauty.

Shall we not learn wisdom from the history of older countries, and teach our people the pleasant lessons of tree-planting and forest production, thereby transforming them into tree lovers and wholesome factors for rehabilitating our landscape and fostering our productive industries.



1. White Pine that will cut 1,000,000 to the forty. Section 1, Town 22 North, Range 14 West.

Opinion of a Government Expert.

AT A MEETING of the Forestry Commission held in February of this year, there was present Mr. George P. Sudworth, a forestry expert from the bureau in Washington, who was asked to discuss with the Commission the topic of our forestry problem here in Michigan, and make such suggestions as occurred to him in connection with our work here in the State. He was very frank in his discussion of the condition in Michigan, and expressed himself to the Commission practically as follows, basing his conclusions upon a report of Thomas H. Sherrard, who was sent out by the bureau at Washington to make an investigation of the lands in Roscommon and Crawford counties which have been set aside for a permanent forestry preserve. Mr. Sudworth said substantially:

"The chief problems of the forestry situation in Michigan are:

"1. Favorable legislation at the next session of the legislature.

"2. Reforestation of the vast area of pine-stump lands belonging to the State.

"3. Collection of data to form the basis of a census of the forest resources of the State, and the economic condition of the forest lands.

"4. Investigations of a scientific character to throw light upon present conditions of stump land and its future.

"5. Practical experiments in conservative lumbering, in fire protection, natural reproduction, tree-planting, etc.

"6. Study of tax and trespass problems.

"There should be favorable action by the legislature extending the powers and resources of the Forestry Commission. The effort put forth to educate the public and popularize the work is commended, and in line with this it is recommended that men within and without the State who have valuable experience should become interested. The bill before the last legislature providing for the acquisition by the Commission of most of the delinquent tax lands of the State, and which was strongly opposed, is recommended. Now is the time to acquire the land for the work when there is so much of it from which company forests may be formed. I am against trying to make a showing before this is done.

"Undoubtedly the greatest single problem before the Commission is the reforestation of the pine-stump lands. These are the very poorest in the State. Some of it is suitable for agriculture, but the bulk as forest land is a better investment for the State. The most serious obstacle to reforestation is fire. A successful and economical State policy of fire protection is the most difficult and important side of the forestry problem. The conditions for fire protection are pressing, for every year the natural conditions are less and less favorable for natural reproduction and the necessity for planting greater.

2. Hardwood that will cut 400,000 to the forty. Section 25, Town 23 North, Range 14 West.

The few seed trees left are rapidly disappearing before the fires, wind and theft.

"There is necessity for collecting data of the forest resources of the State. The information in the possession of the lumber companies, land lookers and supervisors is said to be available and valuable.

Opportunity for conservative lumbering of pine is said to be nearly gone. But there is plenty of opportunity to modify present methods of hardwood lumbering.

The Commission should enter at once upon the protection of the State reserve of 60,000 acres set aside by the last legislature, and with such protection the conditions for natural reproduction are promising. Experimental tree-planting is said to be warranted only in combination with fire protection. Taxation of stumpage has done immense harm in the past, and the right solution doubtless lies in postponing taxation until the lumber is cut. Trespass has been the cause of more loss to the State than all other causes combined, but at present it is unwise to stir up opposition by the too rigid enforcement of the trespass laws."

3. A few good pine trees. Section 1, Town 25 North, Range 14 West.

Improving the Timber on the Jack Pine Plains.

AMONG the discussions of the best methods of utilizing the most unpromising territory in Michigan is the following letter received by the President of the Forestry Commission from D. C. Leach, whose reputation as a cranberry grower at Walton, Michigan, is very widely known. He says in part:

"When I began experimenting on the cranberry marsh at Walton, Michigan, I found the land east of the marsh quite thickly set with oak grubs. The living sprouts from the grubs were from three to twelve feet high. I say living sprouts for the reason that still standing attached to the roots of the grubs were many saplings two or three inches in diameter, which years before had been killed by forest fires. You, of course, know that this process of killing the growth above the ground by occasional fires, and sending up new shoots the following spring, has been going on for a long time. I have no doubt that many of these roots are fifty or more years old. As a rule they seem to be fire proof, and after each succeeding fire send up new shoots as vigorous as any that have preceded them. Meantime the roots continue to grow, spreading out on and near the surface, till many of them are two or three feet in diameter, and sending their roots down many feet into the sandy subsoil.

"These large and deeply-rooted grubs are excellent starting points or foundations for vigorously-growing oak trees. Their vitality is remarkable.

"About ten years ago I had five or six acres of these grubs treated as follows: One of the largest and most thrifty of the sprouts was trimmed up from three to six feet, according to its size. In some cases, where the grub was large, two sprouts were left, usually two or three feet apart.

"Each year after this trimming, during the hot weather of July or August, the young sprouts which had come up were split off the edges of the grub with an ax. It is useless to *cut* off the sprouts above ground, they will invariably grow up again; but treated as I have done, they are soon killed. Generally after this has been done for two summers the grubs cease to send up sprouts and the growth is all turned into the young trees. The rapidity with which they shoot upward and increase in diameter, even on the very light soil, is remarkable. Many of the bushes thus treated two years ago are now vigorous and thrifty young trees, thirty feet and over in height and from five to eight inches in diameter. Last summer I cut a large number of fence posts from these trees, thinning them out where two or three had been left on a single root.

"So satisfactory was the result of my experiment that I have recently gone over some twenty-five acres more in the same way. Where this was done two years ago, the young trees already show marked improvement. The land where this work was done was originally covered with a growth of

4. Land worth $200.00 per acre before timber was removed.

good-sized white pine, with some Norway, and now and then a white oak. The young trees which have grown from the grubs are about equally divided between white and red oak; the red oak is by far the most rapid grower.

"There are millions of acres of stump land in northern Michigan just as favorable for tree culture as the little tract on which my experiment is being successfully worked out. My observation leads me to believe that generally the white pine stump-lands are more favorable for the culture than Norway, and that where there was considerable oak mixed with the pine, is most favorable of any.

"Jack pine plains are poorest of all, and it will require skill, patience and time to grow on them any other timber. But seed plentiful and fire kept out, they could soon be clothed with a vigorous growth of their native trees. The jack pine is a rapid grower. The timber, while not very valuable, is by no means worthless. Doubtless many new uses will be found for it as other pines become scarce and higher in value. It would be a grand achievement to cover all the jack pine plains of Michigan with *green trees* and screen the sandy soil from the burning rays of the sun. Forest fires, as we all know, are the great obstacle in the way of forestry success on the stump lands and plains of the State. These fires come from railroads, hunters, fishermen, careless smokers, from persons cleaning their own lands, and are sometimes deliberately set by residents to burn off the old grass and improve the pasturage for their cattle. Strict laws with severe penalties will be necessary to check the evil."

5. Same land as in No. 4 worth 50 cents per acre after timber was removed. All timber left standing dead.

Suggestions Concerning Reforestation.

A VERY valuable paper was read by Mrs. J. G. Ramsdell before the Woman's Club of Traverse City upon "Protection of Forests," in which occurs the following suggestions, which should have a wide publicity in our State:

"The State owns large tracts of pine-stump land, from which the timber has been removed and which have reverted to the State for taxes. Annual fires, sweeping over them, have destroyed the forest growth remaining after the pine had been removed. It also owns a considerable amount of school, University, Agricultural College, and swamp lands, over which the State has power to do what it will. It may, and I believe ought, to insert in every deed of sale of these lands the clause providing for preservation and maintenance in forest of a considerable percentage of the land conveyed, and make neglect to do so a forfeiture of the title. Adequate laws should be enacted to protect from fires. Animals and birds, which are the natural distributors of forest seeds, such as squirrels, bluejays and the like, should be protected. We have a grove of chestnuts, and each year the bluejays carry away a large number of the nuts, allowing many to fall on the ground and take root, and we find young chestnut trees at considerable distance from the parent grove. In similar way, acorns, butternuts, and even walnuts are distributed by the squirrels. These species are springing up all over our farm. If the State will take this and other reasonable precautions, the denuded forest lands will soon be clothed with a natural growth of trees. About an acre of our apple orchard was on the north side of a hill too steep to cultivate, and was practically abandoned eighteen years ago. The seeds of maple, ash, elm, basswood and pine fell upon this soil and took root, and the growth is now so dense that even dogs are unable to drive rabbits through it. Many of these deciduous trees are four to six inches in diameter. A pine is twelve inches in diameter and forty feet high."

Mrs. Ramsdell gives the following samples of rapidity of growth upon their farm at Traverse City:

"A butternut was planted on our land in 1864; the tree is now eighteen inches in diameter and spreads over a diameter of seventy-four feet. A cottonwood grown from a cutting stuck in the ground in 1872 is now three and one-half feet in diameter and has a top spreading over one hundred and twenty feet. Black walnut trees planted centennial year will cut from seventy-five to one hundred feet of lumber each. Chestnuts planted the same year in grove are, some of them, eighteen inches in diameter. We have pecan trees planted twenty years ago that are six inches in diameter and twenty feet high."

Mrs. Ramsdell makes the following suggestions concerning experimental forestry:

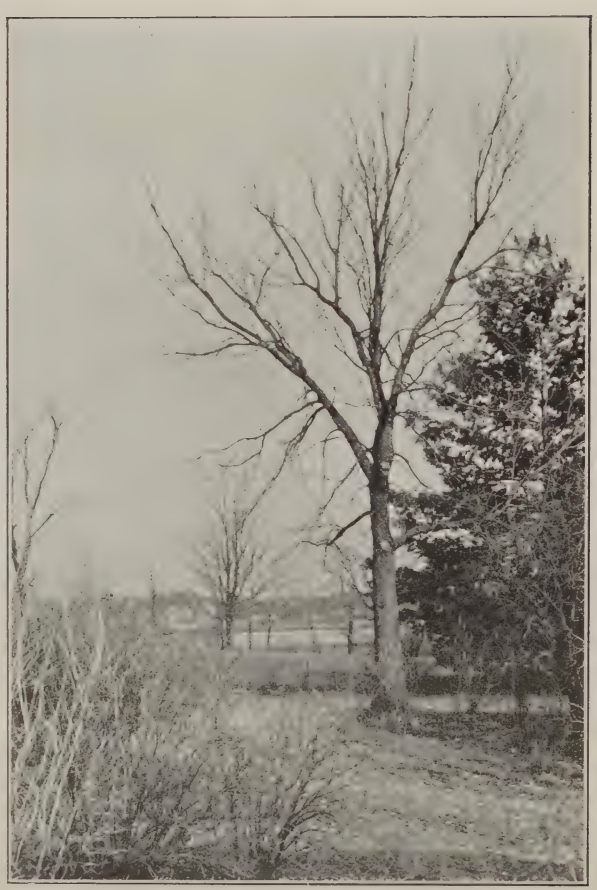
"The State should set apart a tract of land, no less than a township of land, and devote it to experimental forestry,

6. In transition from real to personal property; also in transit from woods to mill. Hemlock being left to peel next summer.

placing it in the hands of the professor of forestry at the Michigan Agricultural College. He should be provided with ample funds to test thoroughly and quickly the feasibility of reforesting such tracts of land. He should publish a bulletin from time to time, for free distribution, giving a complete account of methods pursued and results accomplished."

Mrs. Ramsdell makes the following further suggestion concerning the forest as an accompaniment of the farm:

"As a means of encouraging the owners of farms to preserve their remaining woodlands and replant such as have proved unprofitable to cultivate, I would recommend the exemption of all farm woodland from taxation up to some certain proportion of the area of the farm. I would not exempt non-resident forest lands from taxation that are held for speculative purposes."



7. An elm on Burton Farm, Grand Rapids, Michigan. Seed planted in 1879, and now measures 60 inches in girth 18 inches from the ground. Soil, loose gravel. Water table 50 feet below surface.

Perpetuating the Lumber Business.

THE FOLLOWING vigorous language concerning the duty that concerns us in Michigan of taking care of our future lumber supply, is from the pen of the accomplished editor of the "Lumberman," Mr. J. E. Defebaugh:

"One of the most important questions that confronts Michigan is as to the perpetuation of the lumber business. There are a good many who will state with convincing emphasis that the wealth to be derived from its hardwood forests will be greater than that which was secured from pine. However that may be—and probably no absolute demonstration will ever be possible—certainly the prosperity of the State, the number of men employed in its industries which are more or less dependent upon lumber, and the wealth thus distributed would indicate that at least to a large degree the passing of the pine has been compensated for by the development of the hardwoods. There still remain enormous hardwood resources. In fact, this is one branch of the lumber business which will never entirely pass away, inasmuch as practically every farm raises hardwood trees. There are large sections where the hardwood forests and those of cedar and other inferior growths are almost untouched; and yet if we look far ahead it is easy to conclude that the permanent lumber business of Michigan will rest upon the conifers rather than upon the deciduous forest growth.

"This is so because the hardwood lands are largely of a character that fits them for agriculture, and will eventually be devoted to that use, while the pine lands to a considerable extent are less desirable for that use, and so can more profitably be put to forest growing than to agriculture. There are large areas in both the southern and northern peninsulas of the State which will grow trees better than anything else. Thousands of square miles of this sort of land are practically barren waste because the timber was cut off and fires passed over the land, killing the seeds and the young growth, and now there is nothing but desolation. Where conditions have been favorable, new growth has started in, and students of the subject as well as lumbermen have abandoned the theory that white pine will not replace itself.

"Nature is prodigal and careless in her methods. Valuable timber is often replaced by that less valuable or almost worthless, and seems not to take the trouble to do any replanting at all where conditions have been too adverse; but, assisted, she will reclothe the forest lands of Michigan, as far as they are not wanted for agriculture, with a growth of timber which, if not as valuable as the original magnificent pines, maples or oaks, will at least have some value and be a wonderful resource in the years to come. There are some limited sections in which the soil will grow no tree of much value, but there the jack pine and the black Norway, and perhaps the cedar and birch, will flourish. What has grown on the land once, will grow again.

8. White pine on Burton Farm, Grand Rapids, Michigan. A seedling only a few inches long, pulled up in the woods in 1879. Soil, loose gravel. Water table 50 feet below. Girth, 18 inches above ground in 1901, 47 inches.

"Forest culture is a long-time proposition. Sometimes it may be made to yield some returns in ten years, but for the most part it is another generation than that which undertakes it that must reap the benefit as far as lumber product is concerned. But there are other reasons why reforestation should be undertaken at once. While there is little or no evidence that forests have any influence upon rainfall, they do have some effect upon the climate and are of very great value in retaining and distributing the waterfall. So for the sake of the immediate future, the waste land should be reclothed with trees; and for the sake of the next generation and of the State, whose life is measured by centuries instead of years, forest culture should be practiced.

"The individual with proper encouragement could do something to this end, but the State can do more. All lands that come into its possession better suited for timber growing than for agriculture, should be devoted to that purpose. Fires should be prevented, natural reseeding should be assisted, and where necessary artificial planting may be practiced. The expenditure and the skill required must be backed by an awakened public sentiment. Much has been done in Michigan already in this direction. There have always been some few individuals who have concerned themselves with these matters, but now the people at large are beginning to see, though as through a veil, darkly, that here is a matter of vital importance to them and to their children. By all means uphold the hands of the State government, of the Forestry Commission, and of every means set on foot to promote public interest in the subject and to accomplish something worth while for the lasting benefit of the State."

9. American elms in young forest on Burton Farm, Grand Rapids, Michigan. Seed planted 1891, cultivated two years. Soil, loose gravel. Water table 50 feet below. Growth has been rapid and forest conditions are quite apparent.

Taxation and Forestry.

IN AN EXHAUSTIVE article by Mr. J. J. Hubbell of Manistee, than whom there is no better authority in Michigan on matters of reforestation, we find the following practical suggestions concerning the assessment of property and taxation of timber and timber lands:

"There is no doubt that much property in Michigan has escaped just taxation in the past, and that to include all at a full cash value will materially reduce the rate per cent of the levy, but I contend that it is not right that all properties should be assessed and taxed upon their cash value and at the same rate. There are properties that should be taxed specially and specifically, and also those that should not be taxed at all, as follows:

"1. Properties which are maintained exclusively for the public good, and are not a source of revenue to their owners.

"2. Properties that it is desirable the State or municipal authorities should regulate and in a measure control.

"3. Those that are not injurious to the public, but produce no revenue to their owners.

"We have an example of the first in our churches, hospitals, and other religious and charitable institutions. People voluntarily tax themselves for the support of these properties, and it is generally conceded that as long as they are lawfully used for the benefit of the public alone they ought to be exempt from all further taxation.

"The second class of properties may be said to include our railroad systems, street car lines, telegraph, telephone and express companies, and we may also add water-works and electric lighting plants when operated by private companies. The State can devise no more efficient means of protecting the public from abuses, or of encouraging, controlling or suppressing these forms of property, than the right of specific taxation, and when we adopt the late amendment to our constitution or take any measures to curtail this power, we are taking a step backward in the art of taxation for the combined purpose of benefiting the public and at the same time raising the necessary moneys for public use.

"In regard to the third class of properties, it is not so clear as to what should be done; that is, property that does not produce any revenue for its owner, but which is not detrimental to the public welfare; and yet I think the man who has his means tied up in a business or property that is not paying cannot afford to pay the same tax as the one whose business is yielding handsome returns. Up in our part of the State, if a man wants to transport pine logs by rail for fifty miles, we charge him at the rate of $2.50 per thousand. If a man wants to transport hemlock logs the same distance, we carry them for $1.50 per thousand. Why? Because the man who has the pine can afford to pay that rate, and the man who has the hemlock cannot afford to pay the pine rate. It is simply a

10. Silver leaf maples. Location and management same as for No. 9.

good business arrangement whereby the man with the hemlock is enabled to ship his logs by rail and the railroad makes some money out of his shipments, although not so much as out of the pine. I think our Tax Commission has a problem to solve of this kind; after having ascertained that two different roads may have cost approximately the same sum, they find that one is earning a handsome dividend, the other one not enough to pay running expenses and taxes, and I understand we have one of our most eminent professors at work upon the problem of intangible values to be added to the physical values in order to even up this very principle—that profitable properties can and ought to pay more taxes than unprofitable ones.

"Forestry fortunately complies with all three of the above conditions, for the following reasons:

"1. It is a public benefit. If we preserve the fertility and productiveness of our State; if we continue the resort grounds for our congested cities and southern friends; if we would exemplify our State motto, 'If thou seekest a beautiful peninsula, behold it here,' then we must preserve proper forest areas.

"2. It is desirable that the State should secure and exercise more and more a controlling interest in our forests; and,

"3. Forests are not a source of revenue to their owners until they are cut and converted into lumber and other products.

"For these reasons I claim that our forests should be subject to special forms of taxation. I would advocate a separation of stumpage values from the value of the lands upon which they stand. This has often been done by the lumbermen taking timber deeds only, but as the law does not recognize such a division, the value of the timber is always included with the land in assessments and taxes.

"By such a division the land itself could be assessed and taxed, the title might be retained by the timber holder or not, or the land might revert to the State through failure of taxes being paid or by deeds from the lumbermen. The timber itself I would have exempt from all taxation as long as it is left standing. I would give every forest tree in Michigan—from the smallest shoot to the venerable pine of three centuries—the right to stand and live and grow free of all taxes in return for the benefits it would confer. If any controversy should arise between the land owners and timber owners, then I would give the timber the preference and the right of occupancy, and the land should be dedicated to forestry temporarily or permanently—temporarily, if the land was owned by private individuals, of good agricultural quality and wanted for cultivation after the timber was cut; permanently, if the title was in the State and the land was adapted to forestry rather than agriculture, or was required to make up a proper proportion of forest areas.

"As to the final tax upon timber, I would place the entire amount upon it at the time of cutting, and which for further convenience I will call 'the cutting tax.' I do not feel competent to say what this cutting tax should be, but it ought to

11. Catalpas, 10 years from seed in young forest, planted on Burton Farm, Grand Rapids, Michigan. Cultivated two years. They are now making wood very rapidly. Conditions same as for No. 9.

be based upon a fixed pro rata of the stumpage value of the timber cut, and for the purpose of illustration I will place it at ten per cent as a maximum rate. It would be a manifest injustice to impose this maximum tax immediately after such a law was enacted, as timber that had paid its tax as real estate this year ought not to be taxed the highest rate until the usual rate of taxation had accumulated to approximately that amount. We will say two per cent the first year, four per cent the second, etc., until the highest rate was reached, after which no further increase should be made. What would ten per cent of the stumpage value amount to? If a hardwood forty cut 400,000 feet and the stumpage value was $3 per thousand, then the cutting tax would be $120. If a pine forty was cut with a million feet, the tax would be $800, and if we cut yearly in the State of Michigan two billion feet, with an average stumpage value of $4 per thousand, then the entire tax in the State would amount to $800,000.

"I would suggest the distribution of this cutting tax money between the townships where the timber was cut, the counties and State, and would also appropriate a portion to the use of the Forestry Commission, or whatever system of forestry the State might adopt. Suppose we give the township four per cent, the county, State and Forestry Commission each two per cent. Then, when a hardwood forty was cut, the township would get $48, the county $24, the State $24, and $24 would be devoted to the interests of forestry. Taking the whole State, we would distribute to townships $320,000, to counties, State and forestry $160,000 each annually. This would, in a measure, compensate the townships, counties and State for the withdrawal of stumpage values from the tax rolls, and would place in the hands of our Forestry Commission a handsome sum to be used in the interests of forestry. It would prevent the practice of discrimination against non-resident timber owners, and would take from the lumbermen the excuse or the necessity of cutting on account of alleged excessive taxation from year to year, and no doubt the period of existence of our present mature forests would be materially extended and the work of reforestation greatly encouraged and benefited; and, best of all, our Forestry Commission would be provided with a working capital without being dependent upon an uncertain appropriation by the legislature from year to year, and certainly two per cent of the stumpage value of the timber cut is none too much to expend for the restoration, protection, preservation and continuance of forestry in Michigan."

12. White ash trees, ten years from seed, on Burton Farm, Grand Rapids, Michigan. Conditions same as in No. 9.

The Indiana Method.

THE FOLLOWING is the Indiana law, the intention of which is to promote an intelligent interest in forestry and stimulate men to increase the forest cover of the State:

SECTION 1. *Be it enacted by the General Assembly of the State of Indiana,* That upon any tract of land in the State of Indiana, there may be selected by the owner, or owners, as a permanent forest reservation, a portion not to exceed one-eighth of the total area of said tract, which shall be appraised for taxation at one dollar per acre.

SEC. 2. If such selection is an original forest, containing not less than 170 trees on each acre, it shall become subject to this act upon filing with the auditor of the county in which it is situated, a description of such selection as is hereinafter provided.

SEC. 3. If any land owner shall plant not less than 170 trees on each acre of selected forest reservation, and shall cultivate and maintain the same for three years, then it shall become subject to this act, as herein provided.

SEC. 4. Upon any tract selected as a forest reservation which contains 100 or more original forest trees on each acre, the owner may plant a sufficient number of forest trees which shall make up the required 170 trees per acre, when the same shall become subject to this act, as in section 3.

Important to Farmers.

SEC. 5. No land owner shall receive the benefit of this act who shall permit cattle, horses, sheep, hogs or goats to pasture upon such reservation until said trees are four inches in diameter.

SEC. 6. Whenever any tree or trees shall be removed or die, the owner in order to avail himself of this act shall plant other trees in place of such trees as may be removed or die, and protect said trees until they are four inches in diameter, which shall at all times maintain the full number required by this act.

SEC. 7. Not more than one-fifth of the full number of trees in any forest reservation shall be removed in any one year, excepting that such trees as may die naturally may be removed, when other trees shall be planted.

SEC. 8. Ash, maple, pine, oak, hickory, basswood, elm, black locust, honey locust, Kentucky coffee tree, chestnut, walnut, butternut, larch, tulip tree, mulberry, osage orange, sassafras and catalpa shall be considered forest trees within the meaning of this act.

SEC. 9. It shall be the duty of the auditor in every county to keep a record of all forest reservations as the same shall be filed with him, and he shall require the owner or agent to subscribe under oath the extent and description of the land reserved, and that the number of trees is as required by this

13. White birch trees in young forest on Burton Farm. Seed planted in 1891. Conditions same as in No. 9.

act, and that he will maintain the same according to the intent of this enactment.

Sec. 10. It shall be the duty of the assessor to personally examine the various forest reservations when the real estate is appraised, and to note upon his return the condition of the trees, in order that the intent of this act may be complied with. And if the reservation is properly planted and continuously cared for, he shall appraise the same at one dollar per acre.

14. A group of black locusts, 13 years from seed, sown in a waste corner on Burton Farm, Grand Rapids, Michigan. Large enough to furnish, in 1901, one good fence post and two stakes for each tree.

A Railroad Man's View.

THE FOLLOWING letter was received by the President of the Commission from W. R. Shelby, vice president of the Grand Rapids & Indiana Railway Company:

"My attention has been called to the up-hill work of your Commission in awakening public sentiment and arousing the people of Michigan to the necessity of protecting the comparatively little remaining timber and replacing her forests.

"It should be the duty of every citizen to aid this work in every way possible. Michigan being so blessed formerly by its vast forest wealth makes it difficult perhaps for the average citizen to realize the changed condition from the dense forests of a few years ago to an actual scarcity of suitable building material and forest products generally which exists now. With the continued wholesale and wasteful destruction going on, with no organized effort at reproduction, what must be expected in a few years more? Our white pine, hemlock, spruce and cedar forests are a thing of the past, and the remaining scattered bodies of hardwood, now reached only by branch lines and spur tracks from railroads, are rapidly disappearing. To enforce this statement I may add that the tonnage reports of one railroad line for the twenty years from 1881 to 1901 show that it moved forest products of 14,571,000 tons, an average of 728,550 tons each year. Multiplying this by the forest products moved by all the railroads of the State, and then add millions more floated out by streams and rivers, will show why the scarcity exists.

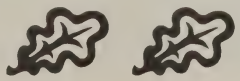
"And what has the State to show for this vast wealth of which it has been so quickly deprived? The railroads of Michigan are now obliged to look elsewhere for their ties and lumber supplies. Compare the prices of today for building material for the cities and towns of Michigan, and the cost to the farmers of the State for building material, fencing, and even for firewood, with the prices of a short time since. These and other facts which might be presented did time permit will show the positive need in the near future and the great importance of a united effort to encourage tree-planting, protecting the remaining timber and the reforestation of our State."

15. An enemy at present, which, under a system of forestry, might be a valuable ally.

A Sportsman's Views.

HON. MARK NORRIS of Grand Rapids is not only an enthusiastic sportsman, but has given a good deal of thought to practical forestry matters. In a letter to the President of the Michigan Forestry Commission he says:

"I think you will find that the sportsmen throughout the State will be unanimous supporters in any well-devised methods looking to the preservation of the forests and the reforestation of denuded areas within the State. All true sportsmen are ardent supporters of the Forestry Commission. They know that the preservation of the wild fauna of a State is and must continue to be dependent upon the continued existence of the forests. They have learned by experience that the removal of the forest dries up the streams, and tends to destroy the fishing, and that the same cause also tends to destroy the haunts and feeding places of the wild animals which range the woods. If these are to be preserved for future generations, an area in which their life may be maintained must be preserved. Perhaps the time has not yet arrived when the public is prepared to adopt in this country the methods used in other countries, notably in Canada, by which the waters and forests in the charge of the State are leased to fishermen and hunters, who undertake the preservation of the same at their expense, and pay the State a rental in addition. This is one of the things on which public sentiment will have to be further aroused before such measures will be popular or can be adopted, but it would seem to me as if it would be no more than right to so form any measures adopted for the preservation of the forests as that such a system could be used when the time was ripe therefor. In Canada such measures are productive of large revenue to the State, and at the same time serve to conserve the fish and animals as well as the forests."



16. Maple sugar industry—the old way. A sugar orchard with little promise for perpetuity: The young timber has been sacrificed.

Permanent Forest Values.

ONE OF THE most accomplished writers upon economic topics is Hon. E. W. Barber of Jackson, Michigan. He brings to bear upon the subject he discusses a wide range of observation and study. In regard to the important questions of increasing the amount of forest cover in Michigan, he gives the following valuable counsel:

"Whenever any portion of our country is visited by such disastrous floods as those which have occurred during the present winter, greater dangers from which were checked only by the advent of cold waves, considerable discussion relative to the protection from forests ensues. Where they are cut away from the hillsides the quantity of silt carried to the beds of streams is increased; the beds are filled up, and the overflow in time of floods is greater. It is plain that filling up the bed of a river causes the heights of water at flood tide to increase, even without any greater quantity of water seeking passage by the river channel.

"Trees and underbrush growing on hillsides are serviceable in checking waste of the soil and the consequent clogging of streams. Forests covering a drainage area lessen the flood heights of rivers by holding part of the rainfall in check and causing it to pass more slowly to the streams. They also conserve the water by diminishing evaporation, and so preventing the absolute drying up of streams in summer. It has not been demonstrated, however, that they have any influence in increasing or diminishing rainfall.

"History is cited to show the relation of forests to population. For example, certain arid districts bordering upon the Mediterranean sea were formerly more thickly populated than at present. This is ascribed to the better climate that prevailed when there were more forests, and, no doubt correctly, the decrease of population has been attributed to the deforestation of the regions in question.

"Again, excessive tree cutting, as in Savoy and elsewhere, has allowed the rain to wash the soil from the mountain slopes into the valleys, greatly to the injury of plant growth in both places. It has also caused an excessive variation of stream volume between sudden floods at times of rain and dwindling streams in drier spells and seasons; but it has not been shown that the destruction of trees has affected the rainfall.

"A certain percentage of forests—much larger than exists in southern Michigan—should be preserved by every means possible. Their influence upon soil and water conditions is important. They hold the soil upon the steep slopes; they prevent erosion in hill lands underlaid with impenetrable subsoils; they prevent the formation of shifting sands to check the rapid, superficial flow of water, and thus also prevent the formation of destructive torrents, with the consequent sanding over of fertile valley lands; they check the filling up of rivers with debris, and, therefore, diminish danger of floods. Also,

17. Maple sugar industry—the old way. Gathering the sap.

it is highly probable that whatever rain might fall would be better saved for springs and streams in a region with a good proportion of forests than in a barren region, and that the injurious action of hot winds, cyclones, tornadoes, hurricanes and drouths, such as afflict the western part of the Mississippi basin, would be diminished if trees could be induced to grow more abundantly, and if the reckless and unnecessary destruction of existing forests should be prevented."

"As the forest's solemn arms stretch over us in benediction, or point with quiet steadfastness to the eternal sky; as they pour out their breath of healing like incense upon our tired souls, if we have come, like Elijah, a day's journey into the wilderness wishing to die because we had lost faith in man and God, let us lie down to sleep upon the tender earth, underneath these arms of protection, and perchance, when we awake, it will seem that an angel has touched us, and fed us too, and we shall rise and go upon the strength of that food for more than forty days."

—Caroline J. Bartlett.

18. Maple sugar industry—the old way. Boiling the sap in the open air. One remove from the caldron kettle.

The Sugar Orchard a Factor in Michigan Forestry.

MAPLE SWEETS are products of forests worthy of consideration in computing the values attached to forestry. Income from the sugar bush has been considered a mere incidental in connection with the farm, but has lately been looked upon as worthy of much consideration in computing the results of the year's work. There has been little attention paid to the addition to sugar orchards, and little or no attention to their continuance as producers of a continuous income in connection with the farm management. The trees that furnish the sap, under the primitive methods of tapping, rapidly deteriorated and had to be used up for wood, and oftentimes went into the log heap. The woodlands used as sugar orchards have very generally been pastured during the summer season and the undergrowth so completely destroyed as to prevent any succession of timber.

However, more recently, intelligent methods of tapping have very generally prevailed, looking towards the least possible injury to the tree and the continuance of its life and usefulness as a sugar producer. In rare instances men have done some figuring with regard to the income from the sugar orchard and decided that it was of sufficient importance to warrant them in making it a permanent reserve upon the farm, and methods have been adopted for its perpetuation. Stock of all kinds have been kept out of the timber and the more valuable maple trees given the best opportunity to grow; and in rare instances farmers have brought the younger trees into use to succeed mature ones that have passed their age of usefulness as sugar producers. It is a pity that a more rational plan of treating the sugar bush had not been thought out before the best maple timber had been destroyed in southern Michigan. For the interest and education of our readers we have brought together a series of views exhibiting the more primitive methods of producing maple sweets as compared with more recent and improved methods. Even the most remote of our illustrations does not go back to the era when the caldron kettle was used for boiling down the sap.

There is no more settled purpose in forestry than this: To secure the very best possible results in an intelligent agriculture, a reasonable proportion of the land should be under a forest cover, which acts as an equalizer of moisture and secures a valuable wind-break to protect the land from rapidly-moving currents of air. Prof. Davenport aptly remarks:

"It is evident from the standpoint of both public economy and private enterprise, that the trees which should receive our fostering care are those that will some time yield a revenue to their owners. Trees whose timber is valuable and that yield valuable products exert fully as beneficial effects upon soil and climate.

"For forestry purposes proper, those trees are most valuable

19. Maple sugar industry—the old way. View of boiling place. Dipping out the finished product.

which yield a revenue without loss to the tree itself. The maple meets these requirements. Timber trees yield a revenue at death; the maple declares as an annual dividend one of the most nutritious and delicious articles of food, which needs only to be known in all its purity to command the market."

The most important question in the discussion of the value of a sugar orchard is the one of how well can it be made to pay. In this connection we quote again as follows from Prof. Davenport, whose farm is in Woodland township, Barry county, this State. He says:

"We tapped one thousand trees, which were scattered over forty acres of land, which is by no means a choice piece of timber, as the same number might be found standing on twenty acres. Besides the land, the cash investment is about seven hundred and fifty dollars. Our annual product sells for from about three hundred and fifty dollars to five hundred dollars, with an average of about four hundred, from which we deduct expenses as follows:

Labor, fuel, etc.	$100 00
Wear of apparatus	15 00
Interest on $750.00 at 6 per cent.	45 00
Making total cost to manufacture	$160 00

This leaves an average annual net profit of $240.00. As all expenses have been deducted, the $240.00 may be considered as the income from an investment in forty acres of maple timber, which is six per cent on the value of the land at $100.00 per acre. As the money value of the land is really but fifty dollars, the investment yields a dividend of twelve per cent."

The above figures which we quote from Prof. Davenport are not large in the aggregate, but the income is produced at a season of the year when very little else could be done on the farm with men and teams. It must be remembered that this income is produced without killing a tree or impoverishing the land.

Some years ago, in a little brochure issued by Prof. A. J. Cook of the Agricultural College on the maple sugar bush, he makes the following statement:

"My bush of 600 trees occupies about twenty acres. At $40.00 per acre this would make:

Land	$800 00
My house cost	150 00
Evaporator and arch	150 00
Buckets	120 00
Spouts	20 00
Gathering tank	10 00
Store trough	10 00
Sled	10 00
Covers	12 00
Incidentals	5 00
Wear and tear	18 00
Total investment	$1,300 00

20. Maple sugar industry. A modern carrying sled and tank. Gathering the sap.

"The interest on this at ten per cent is $130. Add to this $10 for wear and tear and $35 for wood and labor, which is ample, the total cost of manufacture would be $180.

"I would place the average proceeds from trees at forty cents, and when we remember that a single tree has often yielded six gallons of syrup in a single season, and that the whole bush has averaged two gallons to the tree for a single season, this seems a moderate estimate. This would give us $240.00 from our 600 trees, which is $60 above 10 per cent on above capital invested, and all with no risk."

Prof. A. B. Cordley, in commenting upon the above figures, says:

"These are good showings, but they are not the best. A sugar bush may be considered a permanent investment which will continue to pay larger and larger dividends from year to year. Sugar makers have a money saver and can keep it; from the nature of the case over-production is impossible. The area of maple production is very well developed, and if the whole product were converted into maple syrup there would not be enough to sweeten the griddle-cakes of the United States for one week. Fruit lands may become unprofitable on account of over-production, but there will never be an over-production of maple syrup; the supply steadily decreases, the demand steadily increases. All we have to do is to make a gilt-edged article and let people know we have it, to be sure of a gilt-edged price."

21. Maple sugar industry. A modern sugar house with storage tanks. Underground connection with evaporating pan. Covers of storage tanks not shown.

A Few Practical Suggestions.

IN THIS PAMPHLET the Forestry Commission has gathered a few cuts illustrative of the growth of forest trees from the seed, the thought being to illustrate how rapidly trees grow into value for timber purposes, and that one does not need to think, when he plants trees for timber, it is not for himself but for his children or possibly his grandchildren. One of these views is of an elm, the seed of which was planted on the farm belonging to the President of the Michigan Forestry Commission in the spring of 1879. This tree has had no advantage of rich soil, but grows in loose gravel forty-five to fifty feet above the general water-table. At the height of eighteen inches from the ground it measures sixty inches in circumference. Another plate contains the picture of a white pine of the same age as the elm, and stands less than twenty feet from it; it would cut a twelve-foot log larger than a great many that are floated to market, having a circumference of forty-seven inches at the place where it would naturally be sawed off for lumber.

There are several plates taken from a young forest of six acres planted on the same farm ten years ago. These trees were some of them yearlings planted in rows each way as one would plant corn, others were grown from seeds planted in the same manner. The one view of locust trees from a corner of the young forest shows a number of locusts that were planted two years previous to the starting of the main forest growth. That is to say, they have twelve years' growth from the seed, and they would today give a product of one fence post of a good fair size and two fence stakes for each tree. This is an object lesson in rapidity of growth which, in itself, ought to be a stimulant to tree-planting in all regions where fence posts are getting scarce and high in price. There is no timber of rapid growth that will make such excellent and permanent posts as the locust. Red cedar and osage orange may rival it in value, but they are both of such slow growth as not to be in the same class.

22. Maple sugar industry. Straining the sap from gathering tank into the storage tanks.

The Importance of Studying Forests *and* Caring for Them.

NO SYSTEM of agriculture can be long successful and profitable which ignores the necessity of cultivating trees, and which does not recognize the fact that much land in every country can only be made profitable by means of trees. The precepts which should be often repeated to farmers are not that trees produce rain or that trees are sacred objects which cannot be cut without offense to man and nature. The lesson they must learn, if they hope to compete with the farmers trained under more enlightened systems of agriculture are that sterile, rocky, hilly ground cannot long be tilled profitably, and that such land can only be wisely used to produce trees; that the pasturage of domestic animals in woods, or on land only suitable for the growth of trees, is an expensive and wasteful system, as unsatisfactory from a pastoral point of view as it is fatal to the forest; that trees are as much out of place in the strong, level lands, really suitable to permanent tillage, as cattle are out of place in the woods. And they must learn, too, that woodlands can only be made profitable when the same care is given to the selection of trees with reference to soil and climate as is bestowed upon the selection of grain and other crops, and the rules which nature has established for the perpetuation of forests must be studied and obeyed.

W. A. STILES.

23. Maple sugar industry. Interior of modern sugar house during evaporating process.

President Roosevelt Speaks in Behalf of Forests.

THE FOLLOWING extract from President Roosevelt's first message to congress is good reading for the people of Michigan, and we reproduce it as a valuable adjunct to the forestry discussion in our own State:

"The wise administration of the forest reserves will be not less helpful to the interests which depend on water than to those which depend on wood and grass. The water supply itself depends upon the forest. In the arid region it is water, not land, which measures production. The western half of the United States would sustain a population greater than that of our whole country today if the waters that now run to waste were saved and used for irrigation. The forest and water problems are perhaps the most vital internal questions of the United States. Certain of the forest reserves should also be made preserves for the wild forest creatures. All of the reserves should be better protected from fires. Many of them need special protection because of the great injury done by live stock, above all by sheep. The increase of deer, elk and other animals in the Yellowstone Park shows what may be expected when other mountain forests are properly protected by law and properly guarded. Some of these areas have been so denuded of surface vegetation by over-grazing that the ground-breeding birds, including grouse and quail, and many mammals, including deer, have been exterminated or driven away."

American Forests Require Different Management from Those in Europe.

THE STUDY of European methods and results in forestry by competent men is, of course, highly valuable, but it is not enough. It is not even the most important thing for us. Nothing can be very useful to us which is not based upon careful study of the facts and conditions which are peculiar to this country. We should have in time a system of American forestry—we must have it, indeed, if we are to avoid serious disasters to our national interests and civilization. We cannot import and adopt ready-made European systems or methods. The forestry of this country must be the product of growth, which has yet scarcely begun. It will be developed by continued and widespread observation, and by constant comparison of the results of practice. It is necessary to remind ourselves that no useful system of forest management can be originated or created by legislative enactment. There must be considerable special knowledge and considerable national good sense regarding the needs of this country, behind forestry laws, or they will be not only useless, but mischievous.—*Garden and Forest,* Vol. 1, p. 26.

I am willing to confess that since I arrived in this country I have tried hard to forget European forestry. The general conditions in this country are so different from those prevailing abroad that it is impossible and will be impossible—at any rate for generations—to use European forestry methods in this country. We would almost as well introduce Chinese methods; they would not be any less adapted to this country than the German methods, with one exception. What we can learn abroad are the principles of silviculture. Notwithstanding the fact that the forest is utilized in Europe to an extent that is impossible in this country, in its commercial utilization America is far ahead of Europe. In forest finance and forest protection we have to tread our own path. It is necessary for us to build up almost from the beginning a system of American forestry adapted to American conditions, and I think it is worth while to spend one's life in so interesting a task.

DR. C. A. SCHENCK.

The Government is Interested.

VERY EARLY in the year the President of the Commission entered into correspondence with the Hon. Wm. Alden Smith, congressman from Michigan, concerning the establishment in the near future of a permanent forestry preserve in the vicinity of Crawford and Roscommon counties, and he was asked to interest himself in securing for this reservation the lands still belonging to the government within the limits of these two counties. As a result of this correspondence and Mr. Smith's interest in the matter, the Secretary of the Interior directed the Commissioner of the General Land Office to withdraw all of the government holdings in these counties from sale, entry or other disposal, awaiting the action of congress which shall authorize their segregation into a permanent forestry preserve. The amount of land thus set aside is 32,462 acres.

The Commissioner of the Land Office, in commenting upon the matter, said:

"This land is for the most part in small, isolated tracts, all of said townships having been surveyed for more than forty years; and it is believed, in view of the fact that but few entries have been made therein during recent years, the land itself is of little value for agricultural purposes. In view of this fact, and the ultimate disposition sought to be made of this land, it seems wise to me that they should be withdrawn from settlement or other disposal pending the proposed plan of making, in this vicinity, a large and permanent forestry preserve."

A Suggestive Word from a University Professor.

AT THE HEAD of the new Forestry Department at the University of Michigan is Professor Chas. A. Davis. Acting under the instruction of the Board of Regents, Mr. Davis has taken a great interest in the problem of forestry in our State, and in a letter to the President of the Forestry Commission, wherein he discusses various phases of the Michigan problem, he makes the following suggestions:

"If the plan of allowing corporations to lease forest lands that are not suitable for general agriculture could be coupled with the requirement or condition that each of such corporations shall be obliged, by the terms of their contract with the State, to employ a graduate of some one of the several schools of forestry, who shall act as superintendent and regent of the property, it would make a fairly satisfactory arrangement, which should, at the same time, give the holders of the lands good results for their support, as the graduates of these schools are supposed to be trained in the management of fish and game production as well as in forestry proper. The cost of such a man should not greatly exceed that of an ordinary superintendent, who would have to be employed any way, and the returns in the way of more skilful management and the better protection of game and fish, would easily make up the difference. The question of taxes on these properties, if the State should enter upon a plan of this kind, would be one that must be very carefully worked out. In making these suggestions I have in mind lands that will not be included in a State preserve, where all game should be completely protected excepting such as escape from the reservation."

Road-side Vandalism.

PROF. C. D. LAWTON, who has long been interested in the mining and forestry resources of Michigan, in a strong plea for Michigan forests made before a farmers' convention, called attention to the vandalism practiced along our highways in the following vigorous language:

"One of the great calamities, in this regard, that has befallen us of late is the destructive practice of telephone and electric wire companies. These companies have set their posts and strung their wires along our highways and streets in a manner and with the result that gives one the heartache to note the destruction and injury they have caused to shade trees. Along our chief thoroughfares, occupied by these wires, one sees great, noble old trees that have been landmarks since the settlement of the country, or fine rows of maples, ruthlessly cut down and destroyed or mutilated beyond recovery and recognition. In our cities and villages the electric light wires constitute a great evil, when regarded in the light of shade trees.

"The trees are mutilated unnecessarily, and this should be stopped. These companies using wires have no right to destroy trees. They usually first secure the signature of the owners of the land abutting on the highway which they wish to occupy, representing their purpose as the most innocent and harmless in the world. But the lease when signed gives the company full swing and allows the cutting of trees as it sees fit. The safety is in not signing anything, but standing by and not allowing the trees to be cut or injured."

Gleams of Hope in Michigan Forestry.

AS A RESULT of the agitation on forestry subjects since the Michigan Forestry Commission was appointed, the following steps of progress are encouraging:

Public attention has been arrested.

Public sympathy has been awakened.

The danger of further deforestation is apparent to thoughtful citizens everywhere.

Lumbermen are alive to the importance of continuing the supply of raw material.

Manufacturers are questioning where their supplies in the future are to come from.

Railroads are investigating the problem of how most economically to meet the demand for ties.

Those who profit from the great resort industries begin to appreciate the great importance of the virgin forests as a factor in their business.

Sportsmen are thoroughly aroused as to the importance of a permanent forestry preserve and a place of safety for game to reproduce its kind, lest the most interesting forms should be completely eliminated from our borders.

Farmers are alarmed by the changes wrought by the loss of the forests, and are studying economic methods of reforestation.

Fruit-growers are feeling keenly the loss of wind-breaks as protectors of their interests, and are asking what can be done to restore the conditions that have made Michigan famous as a fruit State.

Users of water-power understand, as never before, the importance of maintaining an even flow in our streams, which forest growth about their sources and along their borders alone can produce.

Navigators, and all interested in lake marine, have learned that it costs money to dig the annual deposits of silt from the harbors of Michigan, caused in a large measure by the fitful floods which result from the deforested borders of streams which flow into them.

All who are interested in the beauty of our fair peninsula regret the great loss in the rapidly-diminishing forest cover, and are deeply in earnest in their advocacy of the most profitable methods of restoring a fair proportion of timber growth to the State.

Educators and students of human evolution are becoming impressed by the wonderful and far-reaching influence upon man of the physical geography of countries, and are looking with anxiety upon the ruthless destruction of our forest cover because of its possible effects indirectly through physical changes upon the type of our manhood.

PRESS OF

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