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FORESTRY IN WISCONSIN



# FORESTRY IN WISCONSIN

*A New Outlook*

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Official Report of the Wisconsin  
Commercial Forestry Conference  
Held at Milwaukee, March 28-29

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## Foreword

*The treatment of timber as an agricultural crop grown for profit and the application of biological science in the development of merchantable timber products, as presented at this conference, awakened a general and practical interest and demonstrated that forestry has a business as well as a sentimental basis. Wisconsin has held the first State conference on commercial forestry, and since the national problem is the combined problem of many States and since only by unified effort of American business and the American public can a successful and fundamentally sound solution of this outstanding problem be accomplished, it is believed that other States will follow this example as the logical sequence of the conference held by the Chamber of Commerce of the United States at Chicago in November 1927.*

*The conference was sponsored by the National Chamber through W. DuB. Brookings, Manager of the Natural Resources Production Department, representing the national business viewpoint, and the preparation for and holding of the conference was further made possible by the assistance and sponsorship of the Milwaukee Association of Commerce through Harry J. Bell, Executive Director of that Association. The General Committee, representing all classes of interest in the State's forest resources, prepared the program and invited the participation of forest land owners, users of wood and those who through their official positions or natural inclinations were interested in perpetuating Wisconsin's forests and forest using industries. The result was a truly co-operative achievement.*

*Forestry in Wisconsin, A New Outlook, has been chosen as the title of the official report of the conference, and in its preparation the editors have endeavored to present a complete, continuous and readable story rather than to compile a verbatim report of the conference proceedings.*

*The General Committee.*





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# Forestry in Wisconsin

INTRODUCTION

CONSERVATION-CONSCIOUS, FOREST-WISE

By GLENN FRANK

One cannot touch even lightly the conservation problem without a sense of coming into the presence of one of the nation's really fundamental problems that touches the lives of all of the people of the State.

The value of the conservation movement in Wisconsin and in America will be slight or significant according to the meaning with which its promoters invest it. Conservation is a challenging movement, that sinks its roots into the whole of our social order. Conservation is something more than planting a few trees and protecting a few fish. It is something more than luring harassed men out of stuffy offices into the healing atmosphere of lake and woods. It is something more than turning Wisconsin into a profitable playground for tourists.

These things are important, very important, but I submit that they are, after all, but incidental aspects of conservation in Wisconsin! To do no more than to stimulate the doing of these things is a very worthy venture; the spiritual by-products of these incidental steps in conservation are too precious to lose.

The man who builds a machine may know the craftsman's satisfaction with a job well done, but in some almost mystic way a man who plants a tree becomes a kind of partner with God, in a creative act, because you can not build trees, all you can do is preside at the mystery of their growth. And we know that a people that respects its out-of-doors keeps contact with that eternally young spirit of nature, which helps as nothing else can help, to preserve in us the spirit of youth in that fight against age, that all of us have to make from the day of our birth.

But beyond all these incidental aspects, the conservation movement is primarily a symbol of the fact that, in Wisconsin specifically and in the United States generally, we are today in the twilight zone between the exploitation of the American continent and the enrichment of an American culture, using the term culture in a broad sense of the whole fabric and feel of our common life.

Conservation means that we of this generation and the generations to follow must correct the mistakes made by the pioneer who was content to take all he could out of his immediate environment and then move on to fresh fields, leaving a heritage of denuded and disorderly landscapes and, what is even more unhappy, the psychological heritage of a lazy willingness to tolerate these denuded and disorderly landscapes. Before we can make any marked headway in conservation we must manage, somehow, to substitute the psychology of conservation for the psychology of conquest and exploitation, for, like the pioneer, we still think in terms of the cash returns of a year instead of the civilization of a century.

We must, if we are to do more than play at conservation, substitute stable and scientific agriculture for an unintelligent raping and ruining of the soil; we must substitute intelligent forestry for mere timber slashing; we must dress the land that we have deflowered. To date, we have been little more than salesmen of our natural resources; today, we are challenged to become statesmen of our natural resources! This, as I see it, is the real challenge of conservation, and it will involve a sweeping reform of the American mind, as well as reforestation of our denuded areas.

If we continue to leave our deforested landscapes bleak and barren, these bleak lands will become Wisconsin's "Zone Rouge," a red zone of reminder of the social follies of other generations. After the World War, when the French began their work of reconstruction in the devastated regions, they found that in a certain district the villages had been so demolished and the soil so blasted that redemption, either of village or of the soil, seemed hopeless. Trees, houses, green herbage, these familiar things were all gone. Nothing remained save a curious yellowish grass, never before seen in that part of France, only a great waste of shell-marked earth. What should be done! The French sense of the dramatic came to the rescue. The authorities planned to preserve these regions just as they were, to turn them into protected districts. These districts that had been the scene of exceptional destruction were to be left in their tragic desolation as an eternal reminder of war days. They were to become 'La Zone Rouge', the red zone of reminder that would keep ever fresh the memory of war's barbarities!

That was a dramatic gesture, but not half so dramatic as the reaction of an old French peasant to the plan. M. Claude Riviere

stood one day looking off across a far stretch of devastation in one of these protected districts. Lifting his field glass to his eye, he caught sight of a curiously vivid square of green on a distant hillside. It was a small field in cultivation. M. Riviere went to the spot and found an old peasant happily busy. This old peasant had ignored the plan of the officials that had made this district a part of 'La Zone Rouge' and had gone quietly back to his old home, with his own hands removed the unexploded shells from the soil, and patiently coaxed it back to fertility. He could not understand why a slow fire should be kept burning under the hates of war time and when M. Riviere said to him, 'Don't you realize this is La Zone Rouge and that you are not supposed to cultivate soil in this region?', the old peasant said, with that simple wisdom that people have when they stay close to the soil, 'We have always plowed the land, we must plow again'.

I submit that as a good doctrine, not only for French peasants but for Wisconsin conservationists. We must not leave our deforested areas as Wisconsin's Zone Rouge.

I realize we are concerned here, not with the entire conservation movement, but primarily with the forestry phase of conservation. The very mention of the forest recalls to us some of the happiest memories of our childhood, because the forest is the womb out of which came many of the loveliest legends upon which our spirits fed in childhood—The Babes in the Woods, Sleeping Beauty, The Three Bears, Peter Pan, Little Red Riding Hood. But of course, this Conference was not called primarily to preserve the source of bedtime stories! We are here to try to visualize a worthy and workable forestry program for Wisconsin.

There is now, I think, a pretty general agreement on the fundamentals of an intelligent forestry policy. There are at least four points upon which I think most of us will agree.

First, we must have a conservation-conscious people, a public mind that is forest wise. That is to say, back of the legislative and technical engineering, that must enter into the administration of a forestry program, there is a kind of spiritual engineering that must be done in order to insure the creation and maintenance of a comprehensive and statesmanlike forestry policy. A forestry movement needs an emotional content, as well as an economic content. And I should like to give you, as a slogan for the forestry phase, of the Wisconsin Conservation movement these words from the

lips of old Baron Ferdinand von Mueller: 'I regard the forest as a heritage given to us by Nature, not for spoil or to devastate, but to be wisely used, reverently honored, and carefully maintained'.

Second, we must have public forests—national, state, and municipal. You will find at the gates of nearly every city and town on the Continent of Europe pleasant woodlands which furnish a permanent source of wood and lumber free of transportation charges. These little forests are not for beauty alone, but are a source of the nation's wood supply. Two hundred years of practical experience has shown that their maintenance pays in hard cash. There are towns on the Continent where citizens have not paid one cent in taxes for years, because the revenues from these small communal forests have met all or most of the public charges. And you will find in France, Germany, Switzerland, Norway, and Sweden, private corporations owning and perpetually maintaining forests at a very comfortable profit.

We must increase the size and productivity of our forests. If we are really wise in Wisconsin, if we know how to weld into concerted action all of the forces of this State—public and private, social and scientific—we shall in time be spending the huge sums that we are now putting into trans-continental hauling charges on forest protection and forest cultivation.

Europe is facing this problem today in an aggravated form—England, with half her wood lands cut down for war purposes, France, with her regions devastated by the armies of the enemy. These nations know they must accept the cost of reforestation, or go without its benefits. The time has come when we need that sense of 'must' in Wisconsin. We Badgers travel hundreds and hundreds of miles for a few weeks of healing recreation during the summer season. We can keep much of this vacationing in the State of Wisconsin if we are wise enough to do what has been done in the State of California, where the artificial planting of shade trees and orchards in southern California have transformed a treeless desert into a paradise. (And I don't own any California real estate, either!)

Third, we must maintain a working co-operation between the government and the private owners of timber lands that will make reforestation economically practicable. This involves at least two things: governmental co-operation in fire protection and a system of equitable taxation that will stimulate the growing of forests.



Today, you drive through some of the deforested regions of Wisconsin and you say, 'how terrible!' Maybe some of these lands are still owned by the lumber companies, but we may be perfectly certain that the lumber companies will not risk replanting these lands, with the vast investment that will be involved, if that vast investment must be left at the mercy of a casual cigarette or lighted match! We must realize that the public cannot force private concerns to grow timber for public benefit, unless the public co-operates in making that growing economically practicable. A truly statesmanlike step was taken in this direction by the 1927 Legislature when it passed the new forest crop taxation law. It takes timber growing out of the situation it once was in—which was like the situation you would have in farm crops if they were taxed every three weeks during the growing period!

Fourth, we might find it necessary to exercise some degree of public oversight of forest lands, even when privately owned, to insure the continuing productivity of those timber lands! I do not mean, by this, any paternalistic interference, but simply some public method of insisting that in return for State assistance, the forest lands be kept productive.

Now, I want to go back for a minute to point one, the only point in this list of four points that I want to discuss. I suggested that we must have a conservation-mind before you can create and carry out a real conservation program. Three things must, I think, characterize a conservation-conscious public. A public mind capable of putting through a real conservation program will be marked by these three things:

First, the conservation mind will take long views. The forester is a good symbol of a good citizen, for the forester or the conservationist must act always with his eye on the future. It is a great day for any state when all of its public servants act as if the unborn were part of their constituency, although they have no votes.

This, as well as all three of the characteristics I am suggesting for a conservation-minded public, run counter to three very firmly fixed habits of the American mind. I have said that the conservation mind must take long views, but the American mind does not habitually take long views. The American mind habitually improvises. It hatches policies on the spot, in moments of crisis. When things are running fairly smoothly, we like to take the easiest

way. And any man who insists upon talking about fundamental policies when social and political thunderstorms are not in the sky is looked upon as a impertinent meddler in other peoples' business.

We are very skittish about long time planning in public affairs. We like to wait until some crisis or some campaign is upon us. And then in the heat and hurry of the crisis, we are more likely to think of facile panaceas than of fundamental policies. We improvise our jerry-built policies in the midst of a crisis or campaign and then leave them lying around to become traditions that it is social heresy to question.

Second, the conservation mind will not over-simplify either its problem or the solution of the problem. But the American mind, on all public questions, tends to over simplify both the problem and the solution of the problem. There is nothing to be gained by being less than honest with ourselves. We Americans are patent-medicine-minded. Whether we are dealing with conservation problems or farm problems or labor problems or taxation problems, we have a childlike faith that there must be some pink pill for pale forestry or pale labor or pale business or pale agriculture, and that if we could only find this precious pill, Utopia would be just around the corner. And we are quite impatient of the man who reminds us that none of our public problems are simple. Every public problem is complex; the roots go down into all of the obscure soils of our social order. There are no pink pills that will effect a swift and sure cure for these complicated social and economic problems of ours. There is no archangel at the end of the buzzer that we can ring for and have pull us out of the hole into which our lack of foresight and realistic thinking have landed us.

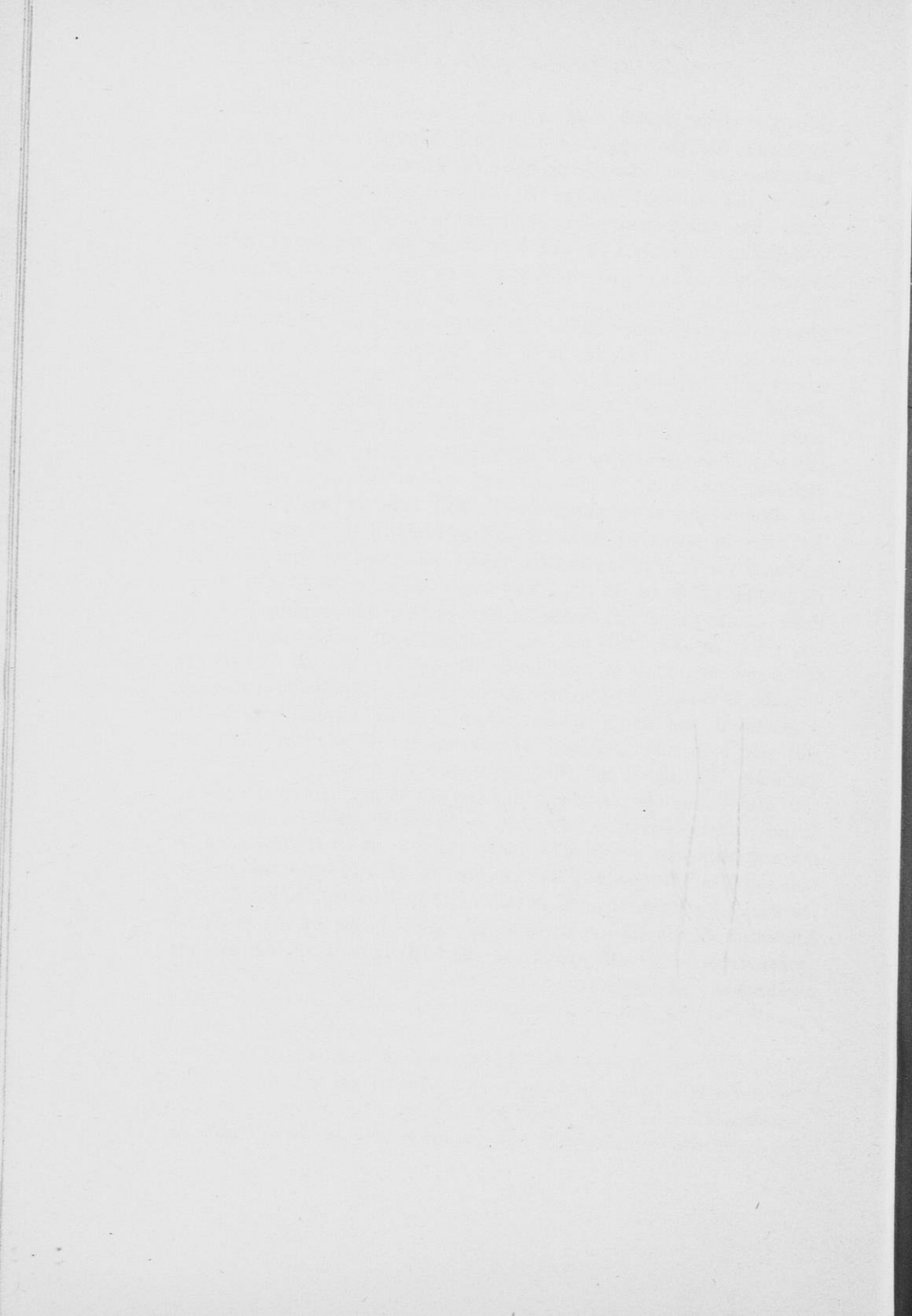
We are always in danger when considering conservation, of thinking that some one device or some one group will do the whole thing. We fall into the habit of the man Mr. Arthur Newton Pack tells about. At a great conservation conference like this, the speaker closed on this note of challenge, 'Is there a man in this audience who has done anything to prevent the destruction of our forests?' A timid man arose in the back of the hall and said, 'If you please, sir, I've shot woodpeckers'!

We must realize that the conservation problem of Wisconsin is not a thing that can be solved by any single effort or farmed out to any single group or agency in the State. Able as the Conservation Commission is, the Conservation Commission alone cannot

solve the conservation problem of Wisconsin. Deeply interested as the Izaak Walton League is, the Izaak Walton League alone cannot solve the conservation problem of Wisconsin. Devoted as the Senate and Assembly of the Wisconsin Legislature are, the Wisconsin Legislature alone cannot solve the conservation problem of Wisconsin. Interested as the lumbermen and the paper men of Wisconsin are, they can not alone solve the conservation problem of Wisconsin. No single agency can do it! This business of conservation is a challenge unlike almost any other challenge that comes to this state. It is a challenge to this commonwealth to see whether it can pull itself together and focus upon this issue of conservation all of the forces of the state—public and private, scientific and social. Conservation is going to be the acid test of the ability of Wisconsin democracy to pull itself together in a vast co-operative venture.

Third, the conservation mind will conduct its conservation activities in terms of research and administration, rather than in terms of warfare and argument. Again, this runs counter to one of the settled habits of the American mind. All over the United States, there is a strange reluctance to deal with public problems in the spirit of research. We tend to deal with our public problems in the terms of attack and defense. We act in the spirit of a man Woodrow Wilson used to tell about. During a political campaign, a candidate was being driven rather hard by a questioner in the audience. Finally a friend of the candidate shouted from the audience, 'Call him a liar, Bill, and make it a fight'!

May I summarize, then, and suggest that a conservation-conscious, a forest-wise, public mind in Wisconsin will be marked by these qualities: *It will take long views; it will not improvise; it will think in the terms of the civilization of a century rather than the cash returns of a year; It will not oversimplify the problem of conservation; it will not oversimplify the solution of the problems of conservation. It will operate on the basis of research rather than on the basis of warfare.*



## CHAPTER I

# SCOPE AND PURPOSE OF THE CONFERENCE

### A BIRD'S EYE VIEW

D. C. EVEREST

In opening the first session of the Wisconsin Commercial Forestry Conference, I am reminded of the first National Commercial Forestry Conference held in Chicago last November, by the Chamber of Commerce of the United States. I am reminded of that meeting on account of the attendance of so many men and women of importance in the educational, commercial, agricultural and industrial life of the country. It indicated that the subject of commercial forestry had aroused the interest of people of vision, who were looking to the future of one of our greatest assets, our timber supply. The attendance here of men and women of similar character indicates the interest of our citizens in the subject as it applies to this state.

The meeting last November was the first national conference and this is the first of, what is hoped to be, a series of state conferences to be held throughout the country for the consideration of the subject from a local standpoint. Wisconsin is fortunate in having the first state conference of its kind. It gives us the opportunity for leadership in the solution of one of the most vital problems confronting the American Public today.

This Conference has developed the very active interest of the College of Agriculture, University of Wisconsin, United States Forest Service, Forest Products Laboratory, Lake States Forest Experiment Station, the Wisconsin Conservation Commission, the Wisconsin Department of Agriculture, the Forestry Committee of the Senate and Assembly, the Izaak Walton League, the Railroads, the Lumber and Pulp and Paper interests. It is particularly gratifying to note the interest of the newspapers throughout the state. They have given generously of their space for news items and many have commented editorially on the subject of commercial forestry. The newspapers of the state will be our strongest allies in the dis-

semination of facts and information in the educational work of the future. As newspapers are now dependent on timber supply, so may the timber supply of the future be dependent on newspapers.

What is the real purpose of this conference? I think perhaps the whole proposition might be summed up in one sentence. The purpose of this conference is to outline ways and means of perpetuating the present industrial, commercial, agricultural and recreational position of the State of Wisconsin.<sup>1</sup>

When we realize that there are only two million acres of merchantable timber remaining out of an original stand of twenty million acres and that there is estimated to be approximately fifteen billion feet of timber on this land, which is being cut at the rate of one billion feet annually, and when we realize that one-fifth of the wage earners of the State, one-fourth of the taxes paid, one-fourth of the revenue of the railroads, one-fourth of the trade of merchants and one-fourth of the business of banks are directly or indirectly dependent on the forests, it seems high time that we consider some program which will make possible the continuation of our business rather than to sit idly by and see the end of the greatest natural resource this state has known. What economic miracle is going to happen to replace the contribution of wood and wood-using industries to the welfare of the state? It can only be accomplished by perpetuating the forest.

National consideration of the subject of Commercial Forestry is an important factor in the future of our wood supply. It will develop the broader view of what is going on throughout the country. It will cause people to think of their own state. But the real way to get action is through State conferences of this sort which will bring home to every citizen the situation as it exists in his locality. What is the land and forest situation in this state? How shall we meet the situation? It is to find an answer to these questions that this conference has been called.

Within the last generation we have seen Wisconsin fall from fourth place as a lumber producing state, until within the last few years it has occupied various places ranging from eleventh to four-

<sup>1</sup> We might perhaps present this in another way by saying that the purpose of the conference is to forcefully bring to the attention of the timber owner, the timber user and the general public the urgent necessity of replenishing the forests and making the growing of a timber crop as practical and profitable as any agricultural crop.

teenth. Within the state the value of lumber products has fallen from second to eighth place. At one time the value of lumber products was only exceeded by flour and grist mill products. The pulp and paper industry, which is the second largest timber using industry, has advanced from eighteenth place to fourth place, and principally through the utilization of wood not suited to the manufacture of lumber. The value of pulp and paper products are now only exceeded by dairy products, motor vehicles, and foundry and machine shop products; and flour and feed, which once lead them all, now occupies seventeenth position. This goes to show the rapidly shifting relative position of industries within this state. Such a situation is not economically sound.

You can all recall prosperous villages, dotted over the central and northern part of this state, which have been wiped out through the exhaustion of timber within that district. The adoption of an intelligent forest policy fifty or even twenty-five years ago might have changed this situation and instead of deserted villages we might today have flourishing towns with an assured continuous timber supply.

We are told that with the passing of the lumber mills, new industries, not dependent on wood, take their places. This may be true but if it is economically sound to establish these new industries in these places, why should we not have the benefit of both? If the lumber and other wood using industries can be maintained from our forest area, then we should also have increased industrial activity through the establishment of these other plants and thus build up a much larger manufacturing center within this state.

The present situation in regard to our forests has brought some good results. It usually follows that if this country is brought up against a stone wall, that someone will find a way out. It brings about discussion of the problem and from discussion comes thought and study and from this we are usually able to evolve new methods and new products which make for conservation and better service to the public.

What attention was paid to the few men who talked conservation of timber seventy-five years ago and yet within that time this particular section has been practically stripped of timber. We are constantly told of the waste of timber, but whatever waste there was in these operations, was due to the fact that there was no market for the product; in other words, there was no economic basis

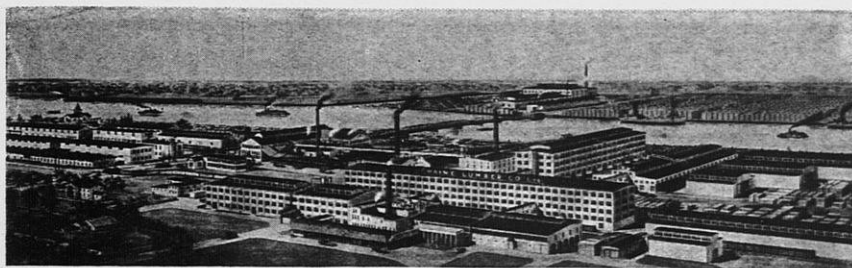
which would permit of harvesting and selling that portion of the timber crop. No lumberman ever wasted anything on which he could make money at the time it was cut. It may look wasteful now, but conditions have changed. Transportation has improved. Uses have changed and increased. The whole economic structure is different and we have simply paid the penalty of developing the greatest nation on earth from its natural resources in the shortest time in which any great country has ever been developed. Today we realize the situation but if we had it to do over again under the same conditions, we would probably not do things materially different from our predecessors. It is what we do now that counts and harking back to what has been done is not going to remedy the situation. From the past we may gain some valuable lessons but to continually howl about the past is not going to help the future, unless we apply the common sense lessons which we should have learned.

The support of a forestry program means the continuance of the wood using industries which in turn means the support of towns and farming communities. There is not an industry in Wisconsin, nor a business nor business man, who is not more or less dependent on the products of the forest. The wood using industries are fourth in value in the United States, but no basic industry is so essential to, and interwoven with, the other industries as wood and wood products.

No other problem which confronts either the people of this state or of the whole country is quite comparable with that of Forestry. It involves the raising of a crop which requires a much longer time for maturity than any other thing which we can really see grow. It means a crop which requires a generation or possibly two generations for growth. It must be made economically sound, otherwise individuals and corporations will not engage in it, and unless we are able to interest private capital in growing trees and making it profitable to do so, we will never accomplish much in Forestry.

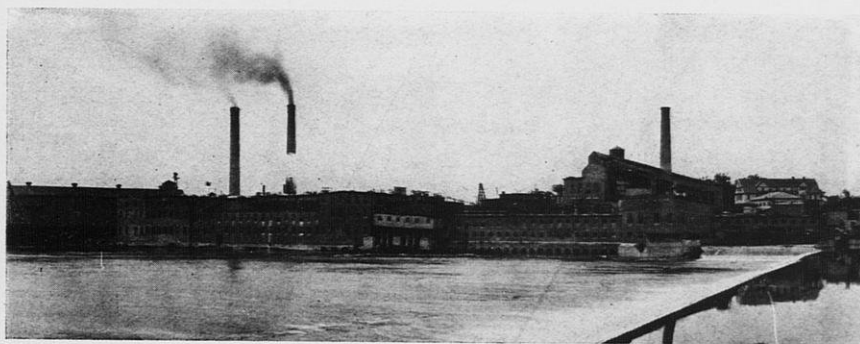
To date, comparatively little is known about what can be done. It means a long drawn out program, a liberal policy on the part of the public and the elimination of the idea that private enterprise is seeking something for nothing. Heretofore, men engaged in the timber business have complained of taxation, but as men have complained about taxes for time immemorial no one really paid much





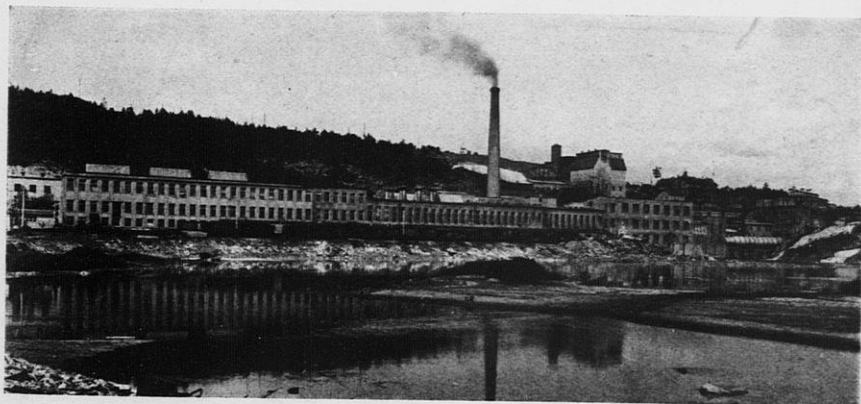
#### A WISCONSIN WOODWORKING PLANT

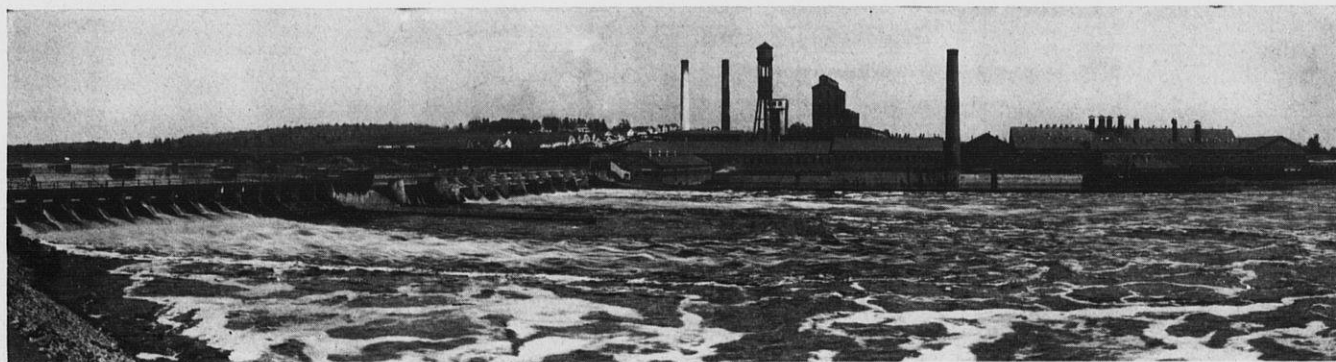
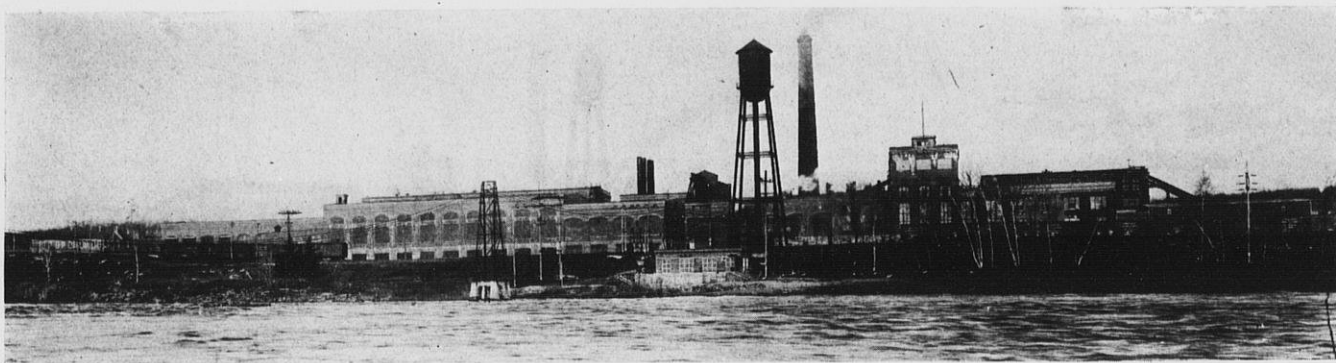
Manufactures 1,500 doors an hour and employs 2,000 men. It is typical of Wisconsin woodworking industries. See page 70.



(Above) PAPER MILL ON FOX RIVER. (Below) PAPER MILL ON MENOMINEE RIVER

Paper manufacture ranks fourth in Wisconsin's industries with an annual output of \$120,950,000, an annual payroll of \$23,400,000, and a capital investment of \$130,000,000. See page 56.





#### PAPER MILLS ON THE WISCONSIN RIVER

Wisconsin paper mills produce the various grades of bond, book, catalog and newsprint papers, kraft, manila, and butchers' wrapping paper, tissues and boxboards, also interesting and novel paper products including wax papers for cups, drinking straws, containers, twistings for furniture and rugs, crêpe tissues for napkins, tablecloths, towels and other household uses, waxed and glassine wrappers and cellucotton.

attention to them, the public was not informed as to the situation and took no interest in it and the owners went on cutting the timber resources of this and other states due to the ever pressing urge to get rid of taxes. Each year they were taxed on the value of the crop, which they had not yet harvested, as well as the land.

Some of the public understood the situation and a few outstanding men with a sense of the economic side and with a vision of the future saw the necessity of a revision in taxation and their efforts, coupled with those of persons interested in perpetuating their business, finally brought about a campaign of education, which in this state at least, has been productive of what has been termed, by students of the subject, one of the best pieces of forest taxation legislation yet enacted in any state. It was the education of the people of the state which made possible the passage of the necessary amendment to the constitution and cleared the way for the present forest taxation bill. The passage of this bill has removed one of the greatest obstacles in the practice of commercial forestry. There still remains one important factor which should be taken care of by legislation, if we are to prolong the life of present stands of timber, and that is the inclusion of mature timber under the act.<sup>1</sup> We have provided for taxation suitable to a commercial forestry program on cut over lands, but we have not relieved the pressure on the owners of our remaining fifteen billion feet of timber one bit. The same destructive urge of taxation on a crop which has not been harvested, is still with us. We have seen the disastrous effects of taxation of that sort in the past, we see it all around us today and yet we make no provision to relieve it. It seems vastly more important to me to husband our present supply rather than to depend entirely on the expectant growth of the future. This is my own view on this subject. I believe this is one of the most important problems we have to solve and that it should be the subject of a resolution from this conference.

We are fortunate in Wisconsin in having perhaps better established facilities for the study of this problem of commercial forestry than in any other state. The College of Agriculture at the University of Wisconsin has taken a deep interest in the subject of the land situation. Dean Russell and Prof. Hibbard are devoting much of their time to this subject and the establishment of the short

<sup>1</sup>The necessity for further modification of this act will probably arise from time to time as we gain more knowledge of this subject.

course in forestry is evidence of the co-operation we may expect from Dean Russell and the College of Agriculture. The Lake States Forest Experiment Station in charge of Dr. Zon will be invaluable to us in the work of Commercial Forestry. The Forest Products Laboratory located within the state will also be of a great help in the problems of wood utilization. The Conservation Commission is made up of men who appreciate the value of forests and are eager to help in the work. The Governor, the Senate and the Assembly have all indicated a decidedly favorable tendency toward forest legislation. The public is beginning to realize how much is dependent on forests. The whole situation seems favorable to the adoption of a commercial forestry policy, which will enable us to perpetuate our timber supply.

Few people seem to have yet grasped the inter-relation of Wisconsin's agricultural, commercial, industrial and recreational interests. Last year it was estimated that one hundred million dollars were spent in this state by tourists. The forests brought them here and every person in the state, directly or indirectly, received some benefit from it. This recreational factor will continue to grow so long as we maintain forest areas. Recreation is dependent on constant re-creation of the forest. Agriculture is interested in the maintenance of the tourist trade and of the wood using industries within the state. A home market for its produce means a greater net return. Taxing units are interested in an assured perpetual income. There is not a single factor in our daily existence which is not in some way dependent on wood, and wood using industries.

It is hoped that out of this conference will develop some definite program of organization of those interested in this subject, which should include our entire citizenship, that we may through education, bring about conditions which will make Commercial Forestry possible.

## NATIONAL ECONOMY AND WISE USE OF LAND

*By* W. M. JARDINE

The time has come when we can speak confidently of the importance of the American timber grower, for within a little more than a decade he has become a national figure. The commercial forestry conference at Chicago in November and this present meet-

ing stand out as milestones on the road of progress toward the handling of our privately-owned timberlands in a plan-wise fashion. In Wisconsin and Louisiana, in Maine and California, and in many States between, land owners are actually engaged in the business of growing timber. The Department of Agriculture is interested in this development, not only because through forest research and co-operation in fire protection, it has been directly concerned in laying the foundation upon which these enterprises have been built, but because timber is one of the nation's most important crops.

Sound national economy is based largely on the wise use of land. About one-fourth of our land is forest land, and the best crop to grow on it is timber. The skillful use and renewal of the timber crop on this land will contribute largely to our prosperity as a nation and as individuals. That this is so will be evident from a glance at the role of timber in our national economic life. Agriculture, in the pursuit of which millions of people are engaged, would profit immensely if timber culture became one of our principal rural industries; for it would provide employment for farm labor in the so-called off seasons, would bring markets for farm products closer to the producer, and would increase the farmer's ability to absorb the products of urban industry. The railroads upon which depend the livelihood of thousands of employees and their families and the stability of many subsidiary industries, would have assurance of continued revenue from the carriage of timber products and of needed supplies of cross ties and many other essentials of railroad operation. Paper manufacturers and publishers, furniture and automobile factories, shippers and house builders, would find direct interest and often direct benefit in the more widespread adoption of timber culture in this country. The migratory forest industries would be stabilized; timber operators would not face the prospect of having to scrap their mills when timber supplies were exhausted; and the workers in these industries would be put in position to establish permanent homes.

In fostering industrial forestry in Wisconsin, with the proper as fire protection, you are doing a fine thing for yourself, for co-operation of the State and the Federal Government in such matter the State and for the Nation.

## A GLANCE AHEAD IN WISCONSIN FORESTRY

By FRED R. ZIMMERMAN

In taking a glance ahead in Wisconsin forestry, it is well to review briefly what has happened in the past. What we say for Wisconsin may be said of all states wrestling with the forestry problem. As our forests disappear, with a resulting increase in the price of all lumber products, there is an increased demand for lumber substitutes. But lumber substitutes only inspired the lumber industry to find a hundred new uses for wood. If peat soils could replace the pulp wood used in our paper mills; if corn stalks could produce all the 2x4 we need; if cement could become the principal building material in all construction work, we would need forests for the ever-increasing demands for lumber. But if lumber were no longer valuable as a building material, forests would still be a necessity to assist in holding moisture for agricultural lands, to balance the climate, to hold flood waters and to save civilization.

In a word,—no forests, no people. As the famous French statesman, Colbert, said: "A country perishes when her forests are gone."

Forests have uses and values which cannot be measured by statistics regarding wood products and wood substitutes. Forestry means the utilization of land which would otherwise be idle. It means control of stream flow, and increased water power. It means the development of our great tourist industry and social progress all along the line. It will do our children little good to inherit the earth if the earth they inherit is cut-over land. If we will treat our forest product as a *crop*, and actually *harvest* timber rather than destroy it, we will learn to produce as we consume.

And what about the future in Wisconsin? The answer lies in the course our people elect to follow. Two roads lie before us— one road leads to the neglect of our natural resources and in the direction of the development of a type of industry that can live on raw materials imported from outside the state. Let me draw a comparison at this point with Wisconsin and the United States. Why is the United States such a good place in which to live? You say, higher wages, higher standards of living, prosperity, opportunity. And what is behind that? We all say, oil, timber, waterpower, coal, iron—natural resources. More oil and more waterpower, more timber and more coal mean more prosperity. No waterpower, no tele-

phone. No timber,—no automobile. No coal—an empty dinner pail. The United States is the land of prosperity because of our natural resources, and we depend upon them. And so the road in Wisconsin that leads to the neglect of our natural resources is the road that leads to ruin. *But* there is another way—the other road leads to a greater development of the natural resources within the borders of the state, and sound, permanent industry depends upon such resources.

Frankly, it is hard for me to conceive the maintenance of any industry within the state that is not, at least in part, rooted in the soil. Our state is endowed with a great variety of natural advantages, fertile soils, lakes and streams which are actual or potential sources of water power, a vast acreage of land of which that part not adapted to agriculture is admirably suited for timber production. And finally, our state is endowed with a population of God-fearing, liberty-loving people, imbued with love for the land which their fathers gave them.

If I interpret this conference correctly, the road that Wisconsin follows will not be the one that leads to the neglect of our natural resources, but the road toward the harmonious development of our farms, our forests and our factories.

I would like to picture our state with every acre of its land producing wealth. After all, the source of all wealth is in the soil, and with soil such as ours, every acre can and should produce wealth. Where farming and agriculture can be profitably conducted, the ultimate destiny of soils is obvious.

But there are 18 million acres of land within the state classed as forest land, of which, however, only two million acres is classed as old virgin forest. Little of this remaining forest land is needed for agriculture, at least during our present generation. I look, therefore, to the time when this vast acreage of land will again be covered with thrifty growing valuable trees; to the time when Wisconsin will regain a dominant position in timber production, a position such as she occupied when I was a boy.

We have in our state about seven million acres of land which once was covered with fine timber but is now cut over and so repeatedly burned that nature alone is unable to bring the forest back. Man must help nature to reclothe this land with forest. We are planting now, on an average, 1,000 acres per year. At this rate it will take 7,000 years to plant up the present 7,000,000 acres of de-

nuded land. Why! we are cutting away the forest at the rate of 100 thousand to 125 thousand acres per year, and we are planting 1,000 acres. I look to the time when the state, instead of planting 1,000 acres will be planting at the rate of 30,000 acres a year. We have in Wisconsin 63,813 farms from 100 to 175 acres; 19,537 farms from 175 to 260 acres; 8,133 farms from 260 to 500 acres. Just one acre per year per farm would add 100,000 acres annually!

The forest problem of the state is a big *land* problem, which affects the very life of our lesser political units, the township and the county. Our local communities in the northern part of the state have grown up on the basis of abundant natural resources, chiefly timber. They were carrying on and were prosperous so long as the lumber industry lasted. And today, after the timber is cut, they are face to face with desperate financial difficulties. Restore the unproductive land to productivity, and you restore the prosperity of the local communities. It is evident that the townships and the counties alone cannot solve the problem. The state, and even the federal government, as well as the owners of the private land, must do their share.

It is obvious that the problems of reforestation cannot be handled by the public alone. Encouragement should be given for the investment of private capital in forestry projects, but if this capital is to be really secured, the public must, in effect, become a party in the enterprise as is done under our forest crop law.

I picture again, in the not distant future, each county having county forests which will, as in little Switzerland, contribute towards the support of the local government. I can visualize two or three million acres of state forests, which year after year will furnish raw materials for our pulp and paper mills and our sawmills, and thus give employment to thousands of citizens of our state. I see a very definite place for the federal government in this program of redemption of idle land. There is room for probably one million acres of National Forests, distributed in suitable units throughout those parts of the state where timber production is obviously the highest use of land. We welcome the federal government in this work of forest reconstruction. We want it to set the pace in the handling of forest lands.

Whatever the county, the state and the federal governments can do, however, is small compared with what the private owners of forest lands themselves must do. The bulk of the land is in their



hands. The traditional private initiative that built up this country must show what it can do with the problem of reforestation. The state will try and help in this reconstructive work of the private land owners by giving effective state-wide fire protection, and by modifying the tax law to encourage timber growing. It is a grave responsibility which I sincerely hope the private owners will discharge creditably and successfully. It is a challenge to the private land owners, and they must not fail, because if they do, the state and federal governments will have to step in and assume the entire responsibility. This country cannot, must not, and will not let the forests disappear from its lands.

In taking a glance ahead in Wisconsin forestry, I see a growing public sentiment which was responsible for our new conservation law and the forest crop law—the most significant steps that have been taken in Wisconsin toward a real program of conservation of our natural resources. I see a Conservation Commission that has a vision of great things, which is shown by the program which it has outlined and with which you are familiar.

The new forest crop law enlists the cooperation of every land owner, small and great, in the state. I see the counties of our state eager to cooperate in this great movement. I see big owners of cut-over lands coming into a keen realization of what this new movement means to them and to the state. I see service clubs, businessmen's organizations, the Izaak Walton League and other organizations interested in conservation of the great outdoors, all alive to the great possibilities of this conservation program. I see the federal government offering aid and cooperation, and an awakened electorate eager to pick up the movement. We are on the eve of a state-wide movement that will not only present every need for conservation of our natural resources, but will in time repair much of the waste and destruction of less wise generations that preceded us.

I take this opportunity of congratulating the Wisconsin Conservation Commission for the effort they are making to establish a sound conservation policy. I want to thank the federal government for the assistance that has been given us by Dr. Zon, Col. Greeley and others in our effort to establish a sound program for reforestation.

I want to congratulate those of you present at this conference, and the industries and municipalities that you represent, for your

interest in this great subject. I want to congratulate this Wisconsin Commercial Forestry Conference on the inauguration of this great movement.

## COMMERCE AND FORESTRY

*By* FRED W. SARGENT

I do not claim to be an authority upon forestry, nor upon reforestation, but I do want to say this, that, as a layman who knows none of the technique of the business, I think one of the sad things that has happened to America is the depletion of its forests with no constructive program for a perpetual scheme of reforestation. The time has arrived when business men should give serious consideration to this subject, but in doing it, there must be some solidarity of method of expression if we are going to achieve real success of action and that is where the United States Chamber of Commerce becomes of value to help the people and the business men of the State of Wisconsin accomplish real business results.

Speaking about commercial forestry, I feel we have a very clear and very specific duty in various ways, ways not only in the interest of present prosperity, but likewise in the interest of generations that are yet unborn. You might believe that I had some selfish interest in the subject—and possibly I have—but these interests, put together in the mass, are the things that make America; they are the things that make commerce, that make business and the things that make commerce in America are the things that are making for real progresses, even in science, art, literature, in the more beautiful things in life. Without commerce the other things all would fail.

So we emphasize the word "commerce" in forestry. We believe in forestry, not only for the purpose of protecting forests, but believe in the consistent and intelligent use of the forests for the welfare and profit of mankind. We believe that government was constituted in America for two fundamental purposes: one was to protect human life; and the other, so far as possible, to insure human liberty. When the government has discharged those functions it ought to be through. We believe when it is through, it should leave, as it has largely left up to the present time, to individual incentive and individual initiative, building of commerce and building of America, because without the encouragement commerce would

fail and fall by the wayside, and as it goes down all these more beautiful things in life would begin to go down with it. So we believe in commercial forestry.

There are in America today, susceptible to reforestation, as I understand it, something like 470,000,000 acres of land, that would otherwise be idle. Private companies have already started this program to the extent of covering something like 21,000,000 acres—nearly equal to the whole of the forests of France—and they are to be commended and encouraged as the pioneers of this movement. But from all sides come reports of a discouraging struggle against conditions, which can be rectified only by public co-operation, through full recognition of individual and collective public responsibility.

This undertaking that has already gone forward should have encouragement from the national government, from the State government and we should adopt a policy of taxation, in my judgment, based on the yield of the forest and not upon the stand of the growing trees. Instead of being compelled to cut these forests in order to meet interest on bond issues, they should be exempted from taxation and only required to pay taxes upon the yield and not upon the stand. When we have done that, we will have removed one of the greatest obstacles in the way of reforestation.

The United States Chamber of Commerce stands for the following program:

- Adequate forest fire protection;
- Taxation of growing timber upon the principle of the yield tax;
- Increased federal research, facilities;
- National inventory of forestry resources;
- State forestry departments;
- Forest management aimed to secure continuous forest production;
- Reforestation of waste lands, lands not reproducing, at the head waters of the navigable streams of the federal government;
- Reforestation of other waste lands by states and municipalities.

Let me tell you how programs are arrived at, if you are not members of it. They are not the conclusions of only a few men here and there, but every Chamber of Commerce throughout the entire United States that belongs to the United States Chamber of Commerce is circularized by ballot, by referenda, as we call it. Studies are made by men in every section and corner of the United States.

They are given full opportunity to vote upon these questions in language free from partiality. Then in that manner we get a concerted expression of thinking men, business men everywhere, with relation to various national problems. They are put together and out of it there comes the result of the ballot. It seems to me that is the finest and best way of solidifying the sentiment and thought of the business men of America.

I am speaking on behalf of President Pierson of the United States Chamber and of the Chamber itself, to lend a word of encouragement to this pioneer movement in the State of Wisconsin. Any assistance that the Chamber of Commerce can give will be rendered freely and having said that, may I also conclude by just saying one more thing? That is, if there is any assistance that your railroads can give, that too will be rendered most freely.

### SENTIMENT ALSO

By OSCAR F. STOTZER

This Wisconsin Conference is a part of a national movement, sponsored by the United States Chamber of Commerce, to speed up action and results on reforestation and conservation from the standpoint of the commercial aspect, giving that the primary emphasis and attention. Until recently, practically all the efforts along the lines of replenishing our forests were based on sentimental arguments, appeals to sportsmen and lovers of the great out-of-doors, and on this occasion we are considering the matter from an entirely different angle.

While these other things were exceedingly helpful, yet students of this problem have evidently come to the conclusion that the matter of rebuilding our forests is a commercial proposition and that thereby men who are interested in forests commercially, have an opportunity also not only to help preserve the remaining beauties of our forest, but also to reap a financial benefit by promoting this movement.

In an article on "Wisconsin Needs Green Forests", Dean H. L. Russell of the University of Wisconsin had this to say: "Green forests, millions of acres of them, are urgently needed in Wisconsin. We need these forests today, and we are going to need them even more in the years that lie ahead. From an economic standpoint it is

of greatest importance that we do something to make possible the continuance, and if possible the extension, of the wood using industries in the State. They must have timber if they are not to close down and wipe out payrolls that aggregate millions of dollars annually. The thousands of families whose financial support comes from the wood-working industries, represent a most important market for the produce of Wisconsin farms and factories."

Our neighbors across the sea say that we Americans have no sense of beauty, no artistic taste, and that all an American can see on anything is the dollar mark. Now we know that that may be true in some instances, and yet we know that it is not of general application. Proof to the contrary, 150,000 members of the Izaak Walton League of America, defenders of woods, waters and wild life, who recognize the spiritual and the æsthetic, and the character-building values of the things that surround us, of nature in all her various forms. (Sherman Brown is the President of the Milwaukee Chapter of the Izaak Walton League.) If I may boast a little, Milwaukee is proud of the fact that it has the largest chapter of the Izaak Walton League in the world. There are thousands of Waltonians, all over the United States, who are connected directly with timber and wood working industries. That is proof that the Europeans are not entirely correct.

## CHAPTER II

# LAND AND FOREST SITUATION IN WISCONSIN WISCONSIN'S IDLE PLANT

By H. L. RUSSELL

I presume there are some manufacturers in the room. You have got a plant—I wonder if you are operating that plant 100% capacity, or 25% capacity. If you are operating at 25% capacity, how are you making it go? Perhaps some of you are farmers. If you have one hundred and sixty acres of land and are only making forty work, you are using one-fourth of your capital investment in order to carry the load. That is what Wisconsin is doing today. We have 35,000,000 acres in this State and only 9,500,000 acres at work. We are, as it were, a manufacturing plant using 25% of our capacity. I don't mean by that that we are to start out on a campaign of converting all of this other acreage of three-fourths into farms, because perhaps we have more farms now than is good for us. It does mean that we must make these idle acres work, for if only one-fourth of the State of Wisconsin is at work today, and that is carrying the load for the other three-fourths, it is about time that we found some way whereby we can even up this load.

We have pulp and paper interests in this State, manufacturing interests, priceless water power. What is going to happen when that water power has to go farther and farther afield for its raw material? We cannot move water power, we cannot move paper mills, but we can bring raw materials back into this State which are going to keep those mills in operation.

There are many people at the present time that regard this so-called cutover region as a liability. It is not a liability unless we want to put it in that column—we can just as well put it in the asset column. It has grown the best pine that this country has ever seen and it can grow it again if we will put it at work. At the present time we are paying on the average \$10.00 a thousand feet for freight charges, compared with \$2.00 twenty-five years ago. Does not that indicate what a load is being laid on all consumers of timber in this State, that they go so far afield for a very considerable proportion of our timber supply?

I am here because of my interest in this thing from a standpoint of development in this State. It is a public question and the public has got to be informed more adequately than they are at the present time. That is where the press comes in and the press is one of the strongest factors we can have at this present time to dramatize and put before the people the eminence of this question. It is a State and not a local matter and this Conference is for the development of ideas. We have got to run these ideas through the fanning mill of discussion, in order to pick out the strongest and heaviest seeds and plant those seeds where they will bear forth fruit, for "by their fruits ye shall know them".

## LAND IN RELATION TO FORESTRY

By B. H. HIBBARD

Until the middle of the last century it was the usual practice to clear land of wood in order to make room for farm crops. Very little prairie land was settled prior to 1850. The forest which had been cleared out of way was mainly of the hardwood type. That the ax must precede the plow was taken for granted, and since there was much less wood needed than was being cut in the clearing process it was likewise taken for granted that the plow should follow the ax, indeed follow it closely.

There are men still living in our upper Lake Michigan counties who helped to cut and burn logs in order to enlarge the plowed fields. This method of creating farms became less prevalent after men learned to live on the prairies. Settlements were greatly accelerated after the railroad, the steel breaking plow, and the self binder were available for overcoming the distances and difficulties of farming in the more open country.

It was the more rapid growth of cities, villages, and farms that gave an impetus to the cutting of timber in the Lake State forest belt, and within a few years a new situation respecting land became evident. The cutover land increased in area. The timber supply to all but a few prophetic individuals seemed inexhaustible. Land in Wisconsin was pre-empted, homesteaded, or obtained with Land Grant College scrip after the law no longer permitted free sale at government price. The preempting and homesteading were transparent frauds in the majority of cases since there was no expectation of

making homes and farms on the land so acquired. The purpose was the acquisition of the timber. As the years passed it developed that the lumber companies found themselves in possession of great tracts of land from which they had removed all the available standing timber. What to do with this land was a problem. None of them had a vision of a new forest grown in place of the old one. Nevertheless, on much of the land from which the timber had been cut another crop soon came into existence. This second crop had not grown since the disappearance of the first. It was rather another type of timber which at first was looked upon as without value, but which in the face of rising prices and new uses of wood came to be worth harvesting. Thus after the pine disappeared, the hardwood and hemlock received attention.

It was after a second and even a third cutting over much of the area of Wisconsin that it finally became evident that the land from which the timber had been taken was failing to arrive. During all the early years of the lumber industry in the state there was little interest manifested in the land as such. At times great amounts were delinquent with respect to tax payments. Then as the second and third crops of timber came into view somebody paid the necessary amount of taxes, gained title to the land, and it was once more on the list as private property.

During all this time blocks of land, small and large, were being offered either by lumber companies, or by land agencies to which they had sold tracts, for sale to settlers. It was assumed that the ultimate destiny of all forest land was the cultivated field. In all of the northern seventeen counties, with a single exception, farms were established before 1880. Thus over a half century has passed since the conquest of the cut-over areas of upper Wisconsin was begun by farmers. During that time about a quarter of the territory of these seventeen counties has been put into farms, but only a quarter of this farm land is improved. Thus but a sixteenth of the area has become crop land, and by no means is all of this able to support its owners.

It becomes evident beyond all dispute that northern Wisconsin is not being settled rapidly by farmers, and, furthermore, that the greater share of it is not going to be settled in the near future. This is not a condemnation of this part of the state. That much of it has excellent soil as well as other assets is beyond argument. The



fact is we are not as a nation in need of more farm land. We are producing too much food stuff as it is. The land about which we are talking no matter how good it may ultimately prove to be is not easily available for farms, and besides some millions of acres are not suitable for farms as we now view the case.

In the meantime lumber is scarce. In fact in nearly all charts showing the increase in the prices of important products during the past forty or fifty years, lumber heads the list. We have taken little heed to the demand for more wood. Since the cutting of the virgin pine of Wisconsin enough time has elapsed for the growing of another crop, at least of pulp wood, and second growth of many kinds which now would have been approaching merchantable size. But alas, the amount of timber, as all interested in the subject know, has been reduced to a pitiful minimum of a million and a half acres of fairly heavy timber with a few millions of second growth, ranging from mere brush up to promising proportions. With the Psalmist we can say while contemplating our forest domains: "While I was musing, the fire burned." In fact that fire has burned over 200,000 acres of forest land in Wisconsin annually in recent years. Half of this burned area fails to restock itself and since much of it is unsuited to farming becomes so far as this generation is concerned a desert. Thus the fire creates a land problem of serious proportions taking as it does the value out from one standpoint and failing the put it in from another, or any other.

It is not long ago that a fire was looked upon as beneficial where cutover land only was burned. During the '90's of the last century burned-over land was assessed for taxation purposes at a higher figure than virgin timber. Now virgin timber is worth not merely more, but possibly ten to a hundred times as much as denuded land. This is but another way of calling attention to the fact that much cut-over land is worth little, and some burned over land nothing, on the basis of the present land market.

Land in a very real sense becomes the basis of life in a forest country after the timber is once removed. Prior to that time the importance of the land is obscured by the crop which nature has furnished ready made. In all our modern counties the importance of land, and at the same time its failure to carry the load which has recently been put upon it is one of the outstanding features of the upper Wisconsin counties. Stripped of its virgin timber, in many

cases burned to sterility by fires and repeated fires, much of this cut-over land is breaking down as a source of public revenue. The reason it is failing as a source of public revenue is the fact that it is failing as a source of private revenue. It fails under present conditions to commend itself to the private investor because of the distant and uncertain prospect of a profitable timber harvest, and the prospect, not much more promising, of an opportunity of making of it self-sustaining farms. Since 1920 the belief that all arable timberland is destined to become valuable farm land in the near future has been profoundly shaken. That such land must all be made into farm land, in the near future is a dream from which we have awakened. It isn't coming to pass. At the rate we have progressed in clearing land since 1880 the northern seventeen counties will keep us going for about 800 years, while at the rate of progress since 1920 it would take forever. Jefferson once predicted that it would take 500 years to settle the Mississippi Valley. Since Jefferson's time it has been thought clever to comment on his lack of comprehension of the times just ahead of him. However, if Jefferson meant the settlement of the cut-over lands of the Lake States it would now appear that he was at least conservative, under-guessing the required time by 300 years.

We thought a few decades ago that public land was becoming scarce. In Wisconsin the amount of federal domain was reduced virtually to nothing forty years ago. The state lands while reaching to a considerable fraction of a million acres were still inconsiderable, and at all events were not increasing. But an unseen force was at work to bring back for public consideration a vast amount of land, once private property. With the growth of widely scattered settlements the demands for schools, roads, and other attributes of government became formidable. While speculators had faith in making sales to settlers, and while timber still existed in considerable quantities it was possible to raise the required money. The timber owners had faith in the continued demand for lumber, paper, and poles, while the speculators had faith in the suckers which annually presented themselves as sacrifices at the land opening ceremonies. The timber is still an important, though vanishing, source of public revenue. Except as taxation and forestry plans and prospects are revamped, standing timber is destined to play a smaller and smaller role as the basis of public revenue. Likewise with higher labor costs together with relatively low prices for farm produce the outlook for



ASPEN TAKING POSSESSION AFTER CLEAR CUTTING

Aspen reproduction covers about seven million acres in Wisconsin. Note the young spruce and white pine developing under aspen in picture at left. Photographs furnished by U. S. Forest Service.



#### EROSION IN SOUTHWESTERN WISCONSIN

Trees protect slopes from erosion. Compare cleared and wooded portion of the slope. This land should not be cleared without being properly sodded or terraced to prevent loss of soil and ultimate sterility. Photograph furnished by U. S. Forest Service.

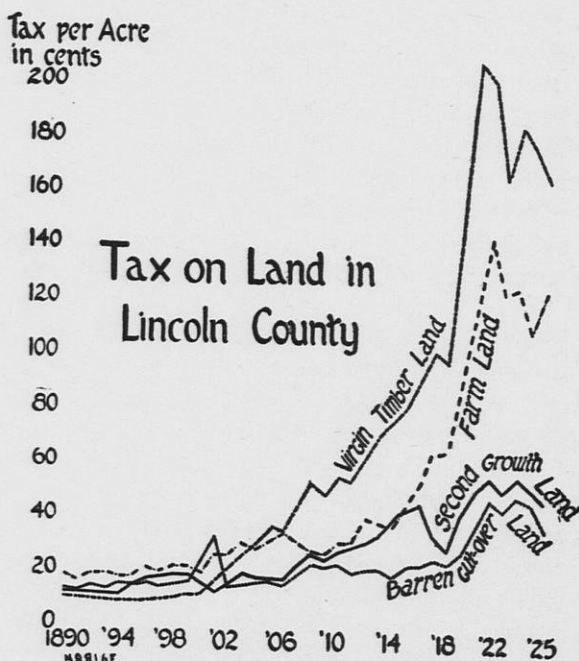
farming on land now covered with brush and stumps, not to mention stones, is far from alluring. The practical demonstration of this view is to be found in the lack of demand for cut-over land by farmers, evident in every northern county.

We always have among us a large number of people, even the majority under some circumstances, who object to social restraints over economic activities. The belief is strong that a man should be allowed to do as he pleases with that which is his own. Specifically the owner of land believes that he has a right to sell to anyone who cares to buy, and likewise the buyer feels that he should have the right to deal where and how he pleases. This is indeed in accordance with past practices. We have before us as the results of this extreme freedom of action our well established farming communities, our cities and villages. Freedom to enter into business has been almost absolute. But along with the good results, which we freely acknowledge, we have many results not so good. Scattered all through the cutover sections of the Lake States are numberless evidences of unfortunate attempts to turn the wilderness into farms. Deserted farmsteads, schools with one, two or no pupils; roads built at great expense, to accommodate settlements which never develop; local civil governmental units without sufficient funds; all these testify to the lack of wisdom in leaving the solution of the land question to parties concerned merely in the sale of the land. Some one objects to state and county control over the use of land on the ground that under private enterprise many valuable tracts of land are continually coming into use. It is pointed out that these valuable tracts might not be developed under state direction. The same idea was suggested to President Roosevelt when he was throwing about all the remaining government forest land into the National Forests. His reply was characteristic and masterful: "If there is any land included in the Reserves which ought to be used for some other purpose there will be plenty of opportunity to release it for such purpose."

The fact is the state of Wisconsin, like many other states finds itself face to face with a land problem of major importance. Instead of having no longer a state or public domain, as seemed to be the case a few years ago, there is now coming back into the hands of the state—literally the counties—an amount of land of appalling magnitude. The Single Taxers tell us that land can be taxed into use. What we are faced with is a situation into which land is being

taxed out of use in some cases, and in still other cases, vastly more in number, is being taxed out of potential use.

In the seventeen northern counties of the state there are this year about two and a half million acres of tax delinquent land. Some of this had been delinquent over a period of years. Only about a tenth of this area is being redeemed by the owners. That is, a tenth of the outstanding amount delinquent for any given year is redeemed during the year. The counties are in a dilemma. Until very recently counties were reluctant to take title to land in view of the fact that no policies of management of the same have until very recently been developed.



We have talked vaguely of the evils of concentration in ownership of land. Now we learn that the greatest owner of land in Marinette County is Marinette County. One hundred thousand acres of land has been taken over by this county, mainly within the past few months. What shall be done with such a quantity of land—more than a tenth of the entire area—is a man-sized problem, but steps are being taken toward its solution. What is to be the mere physical

limit of this movement away from private, toward a type of public ownership of land no one can say, but that it is to continue for some time is all but assured. In any case it is continuing up to the present moment, there being decidedly more delinquent land this year than last.

The sum and substance of the land question is this: We have millions of acres of land nearly all useful for some purpose, which, however, does not lend itself to development under the free-for-all system which has served moderately well in the older settled parts of the country. Much of this land, now under discussion, is excellent for the production of timber, of game, and for recreational purposes. This land, the most of it, was capable of bearing a considerable tax burden while it was covered with timber, and again much of it while it was classed as prospective farm land. Now the farm prospects are for much of it remote, and the efforts to collect taxes are breaking down. In the interest of a wiser use of this land it is now necessary to establish the meets and bounds of settlement so as to conform to an economical use of public revenues; at the same time enabling the state to make ample provision for schools and roads—not where any and every settler might choose to locate—but where in the judgment of the state and particularly in the judgment of local authorities, settlers, schools, and roads ought to be encouraged. This means that where we have settlements there will be provided the conveniences of life and civilization, and where we do not have settlers with their farms, or resort owners with their tourists, or power companies with their enterprise, we shall have forests producing timber, sheltering wild life, protecting the soil and equalizing the flow of water. All of this far-reaching program rests on the land policy of the state, and comes down to the question of what shall be done with land which is no longer able to carry its load of settlers, or of taxes, but which under different treatment could play its part in a progressive plan.

## FOREST CONDITIONS IN WISCONSIN

*By* RAPHAEL ZON

Originally the forests of Wisconsin were largely of two kinds, (1) Norway and white pine forests, and (2) hardwood forests. On the light, sandy soils Norway pine predominated. On the better

sandy soils white pine was the principal tree. The hardwoods were made up of hard maple, yellow birch, beech, with considerable admixture of hemlock, and throughout the hardwood forest were found scattered trees of white pine of the finest development.

In 1875 there was some 130 billion board feet of Norway and white pine timber in the state and some 16 billion of hardwood timber. Even about 30 years ago, in 1897, there was still 17 billion board feet of Norway and white pine, while the hardwoods, although culled over for the white pine, remained still practically intact. Today there hardly remains a billion feet of Norway and white pine, and only about 7 billion board feet of such hardwoods as yellow birch, maple, basswood, beech, and also oak. The total stand of merchantable timber in Wisconsin today, including all kinds of timber such as pine, hemlock, tamarack, spruce, cedar, balsam, and all the hardwoods, is about 12½ billion board feet.

It would be, however, a mistaken idea to think that aside from the 2,000,000 acres of forest still classed as virgin forest, the rest of the 18,000,000 acres of forest land is devastated, in the sense that the land is entirely bare or is covered with blackberry bushes and similar growth. As a matter of fact, there is very little actually bare forest land in Wisconsin. Nature, following the old established law that it does not tolerate a vacuum, tried hard to reclothe the cut-over and burned land with some kind of a forest growth. Our surveys show that there is probably not more than 5 per cent of the entire forest area of 18,000,000 acres in the state that may be classed as devastated land and that includes also the open muskegs and swamps which were unproductive land from time immemorial. About a *million* acres, then, is all that can be called strictly unproductive barren land in the state.

What happened is this.

As a result of logging and fires, the Norway pine on the light sandy soils was replaced by jack pine, the white pine on the better sandy soils and over a large part of the hardwood land was replaced by aspen (popple). On many areas of light sandy soils where repeated fires have eliminated the pine, "scrub" oak because of its sprouting capacity, now predominates the ground. As a result of logging and fires, the change was not from virgin forest to bare land, but a change from more valuable kinds of timber such as Norway pine, white pine, birch, maple, and basswood, to inferior kinds of timber like jack pine, popple, and scrub oak.



The present forest area of the state may be roughly divided something like this: under jack pine and scrub oak about 3,000,000 acres, under aspen close to 7,000,000 acres, in spruce swamp land about  $\frac{1}{2}$  million acres, in hardwood-hemlock forest close to 2,000,000 acres, and the oak-hickory forests of the southern portion of the state, mostly woodlots, occupying about 5,000,000 acres. These woodlots consisting mostly of oak and hickories, although somewhat thinned out, are still the remnants of the same old forest.

More than one-half of the entire forest land, then, is under jack pine, scrub oak, and aspen. If we disregard the 5,000,000 acres or more of farmers' woodlots in the southern part of the state, nearly five-sixths of the forest land in the northern counties of the state are either jack pine, popple, or scrub oak land. A great deal of the popple that came up on sandy soils will never be merchantable timber. Many of the popple stands are understocked, and for this reason will also produce a little of merchantable timber. The same is true of some oak land. Although the land is covered with some growth of these trees, it is either of such poor development or of such open character that it cannot be classed as merchantable forest.

There are no accurate surveys available to determine the exact extent of such unmerchantable stands. Some estimates indicate that there are not less than about 7,000,000 acres of forest land in the state which is either bare or covered with such unsatisfactory forest growth that will have to be replanted artificially if the land is to become productive land in the true sense of the word.

How long will Wisconsin forests last? This is a very simple problem in arithmetic. There remains today in Wisconsin about  $12\frac{1}{2}$  billion feet of merchantable timber of all kinds. Wisconsin is cutting every year a little over one billion board feet of lumber, and in addition over 500,000 cords of pulpwood. It imports more than this amount from other states.

If we disregard the amount of timber grown, the merchantable stand at the present rate of cutting for lumber and pulpwood should not last more than about 12 years. Some second growth, however, is taking place on the cut-over land. As a matter of fact, and this may seem strange after all the talk we have heard about forest devastation, there actually is more wood being grown in Wisconsin today than is being cut. This would be very encouraging, if the growth which takes place, were in the kind of timber Wisconsin needs most and uses most.

Recent studies of the Experiment Station show that the hardwood timber including the farmers' woodlots, is being cut at the rate of about one billion feet a year. Of this only about one-third is replaced by growth. Leaving out the woodlots, only one-fifth is replaced by growth and four-fifths come out from the small reserve of old timber accumulated during the past centuries. Of spruce pulpwood, which the State used to the amount of about 400,000 cords a year, it replaced by growth only 50,000 cords a year, and must get 350,000 cords either by depleting the few remaining stands of merchantable timber or by importing it from Minnesota and Upper Michigan. Of hemlock, which the State uses at the rate of 540,000 cords a year, practically nothing is replaced by growth. We are living on the hemlock capital accumulated in the past.

Where does then, the growth take place? It takes place in our aspen, jack pine, and scrub oak stands. There are some 7 million acres of popple land in the State, which grows at the rate of  $2\frac{1}{2}$  million cords a year. Yet we use according to official statistics, only about 12,000 cords a year. Popple is a short-lived tree. When it is 60 years old, it begins to deteriorate. Unless we increase tremendously the use of popple in the State, it will die out and fall down without serving any useful purpose. This growth, therefore, is of little benefit at present to the State.

Another wood that grows in excess of its present cut is jack pine. The State uses 90,000 cords of jack pine, while the growth is over one million cords a year. This is the most encouraging thing, as jack pine is rapidly coming into use, and the growth in excess of the cut adds to our future available supplies. In spite, therefore, of the fact that more wood is growing today in Wisconsin than is being cut, the kind of wood which is most in demand—the hardwood lumber, the spruce and hemlock pulpwood—are being depleted at a rapid rate. The species which grow in excess of the present cut are the ones which are now but of little use.

Another problem is erosion. A study, made last summer by the Experiment Station on the relation of forest cover to floods, revealed the fact that it is not the northern cut-over lands of Wisconsin that are the most dangerous areas, but the southwestern farming portion of the State. The most critical forest areas lie largely in the unglaciated region of the southwestern portion of the State, in such counties as St. Croix, Pierce, Buffalo, Trempea-

leau, La Crosse, Crawford, and Grant. It includes the whole strip in the southwestern portion of the State from the mouth of the St. Croix River west and southwest to the Illinois boundary, a few miles west of Beloit. It embraces the lower portions of the drainage areas of the Chippewa, Black, and Wisconsin Rivers, the western portion of the drainage area of the Rock River, and almost all of the drainage areas of the smaller streams which flow directly into the Mississippi River below Prescott. The gross area, within which critical conditions are found, is some 6,450,000 acres.

The land within these sections is deeply dissected by ravines and streams. The streams are very rapid. They are dry part of the year, but rise quickly after heavy rains, stay at high water for a short time, and then fall again. Not only is this land of such character as to permit a rapid run-off and excessive erosion, but it is so located that the run-off is discharged promptly into the main channel of the Mississippi River. The flat uplands are in farms but the steep slopes of the streams are still largely wooded. The wooded slopes are used for pasture and, as a general rule, are over-grazed. The timber has been culled over. Where the stands are open, there is grass, the ground is compact and is not in a condition to absorb or retain large quantities of water. The forest is in the nature of small farm woodlots which do not lend themselves to acquisition by states or federal government. Yet, the importance of retaining the steep slopes of this dissected section under forest cover is very great. According to the Wisconsin Agricultural Experiment Station, serious erosion is found on 75 per cent of the farms in this section.

This is the situation. What can be done about it?

The life of the old hardwood merchantable stand should be prolonged as much as possible (1) by reducing the cut to actual growth; (2) by adopting selective logging in place of clear cutting; and (3) by protecting the cut-over hardwood land from fire and speeding up the growth by proper care. The hardwood industry in the State depends on the supply of large-sized timber. This supply can be maintained only by selective logging.

The use of popple should be increased. Even if the figures of popple consumption are greatly underestimated and its actual cut is three times the reported cut, it is still only a fraction of what actually grows. It is entirely suitable for paper making, especially for book paper. Much of the popple land should be converted gradually into more valuable forests of white pine and spruce. This

can be done by under-planting the present aspen stands with the more valuable species.

The vast area of some 7 million acres of badly burned-over and ruined land now restocked with undersized open stands of jack pine and popple should be planted up. The State, at present, is planting about 1,000 acres a year. How long will it take to plant up the 7 million acres of denuded land at such a rate? Just a trifle—only 7,000 years.

The solution of the erosion problem lies in the maintenance of the steeper slopes in timber and replacing the forest on those slopes already denuded and the prevention of over-grazing in the woodland pastures. As a general policy the counties and towns in these sections should be encouraged to establish county and town forests. These will cover only small areas. In addition, the provisions of the Clark-McNary law for distribution of planting stock to farmers and forest extension should be applied specifically and liberally to that section. The fire hazard is small, and no special fire protection measures are necessary.

To further encourage the farmer in maintaining a good forest cover on the slopes and keeping his woodlot in good growing condition, better methods of wood utilization in connection with the existing wood-using industries should be taught. It may be further desirable to amend the existing forest tax law to provide easement of taxation to those woodlot owners who would be willing to handle their woodlots effectively by eliminating grazing and clear cutting. Such provision is already incorporated in the present forest tax law, except that it permits grazing in the woodlots.

Yet we are talking about forestry. We are merely kidding ourselves. It is almost like trying to put out a big fire by pouring water with a teacup. We do not hesitate, and very properly, to speak of plans for highway construction in terms of millions of dollars. When it comes to forestry, we think and act in terms of thousands of dollars. Unless we conceive forestry in the State as a big, urgent problem, unless we are ready to begin restoration of our denuded forest lands at the rate of 100,000 acres a year, we shall not get anywhere. France, for instance, has just a little larger forest area than the state of Wisconsin. France grows close to 1½ billion board feet of lumber a year, and that is the amount which it also cuts. If Wisconsin were to cut lumber only to the amount that it grows, we could only cut about 300 million board feet. The

forests of France, together with the land, are valued at over \$1,000,000,000. What is the value of the cut-over land of Wisconsin today? Yet what France has done, Wisconsin can also do.

## THE NEED OF LAND CLASSIFICATION

By WALTER A. DUFFY

We have become so accustomed to think of land in terms of agriculture that it is very easy to see why by an act of legislation of 1915, the Commissioner of Agriculture was empowered to cause to be collected and printed, information, relating to the use of land. The information collected, printed and distributed during the war period was largely pertaining to the use of land for farms.

The history of Wisconsin, however, as well as of many other timber producing states, shows that the plow has not followed the ax. In other words, a vast area neither forest or farm remains, and what shall we do with those millions of acres, is a question that we are now facing and for which we must seek a solution.

The first step to the solution, is the classification of this land, and this means, first of all that we must take an inventory of our land resources. With this inventory before us, we can then put each kind of land to the use, in which it can best serve man, be that agriculture, forests or recreation.

In the use of land for agriculture, the trend for some decades back has been toward greater efficiency, and therefore increased production without increasing the amount of land in use, in fact many millions of acres of land have gone out of use for farm crops during this period. Some of this land should never have been cleared for farms, while other land such as good pastures should have remained in pastures.

However now, we are called upon for greater efficiency in using land for forests and other uses, and so this morning it is my purpose to try and make it plain why under the provision of the act to which I have referred, we have started to take an inventory of land in the northern part of the state, that we may be able for example, to give information to woodworking industries, people seeking summer homes, summer visitors and those desiring to occupy land with forest projects, fur ranches, wild game refuges, etc.; as well as those seeking farm homes.

It was the wisdom of the Foresters which led to the conservation movement twenty years ago, for this is the 20th anniversary of the first great conference called by the Father of American Conservation.

Theodore Roosevelt said, in that memorable address, on May 13th, 1908, among many other things of equal importance, "Our forests are so depleted as to multiply the cost of forest products. We began with an unapproached heritage of timber and already more than half this heritage is gone".

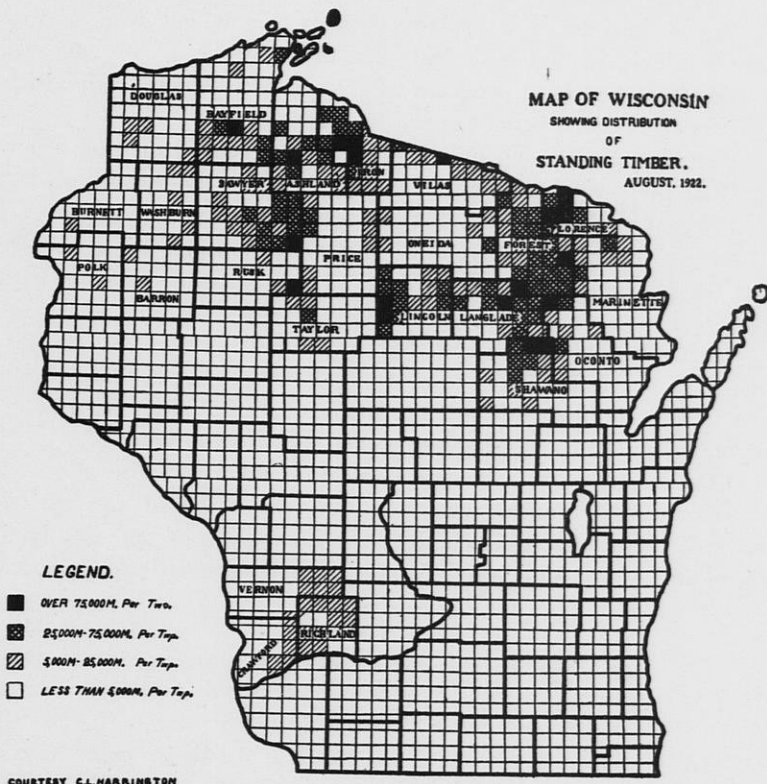
Again we return to the admonition of the great conservationist, who continued his address by saying, "*We must improve on nature by compelling the resources to renew and even reconstruct themselves in such a manner as to serve increasingly beneficial uses to ourselves and to those who come after us.*"

I may add here, that our democracy so far has evolved by trial and error. We have had the trials and witnessed the errors, and now as in biblical times we return to interpret the admonition of the prophet. The fact that we need action to replace controversy and reaction of the past twenty years is exemplified in this gathering, and in order to have action, we must know what the best use is to which all of our land can be placed. The three outstanding uses for land in northern Wisconsin are for *forests, recreation* and for *agriculture*. Some land will go into each of these three uses. But which land shall go? Under the methods of the past, we have left it to *trial and error*. The land inventory is an attempt to guide the trend of utilization. Those seeking forest land, summer homes, recreational grounds, and farms can then be directed most advantageously. The soil survey so far made in the state has been very helpful but it is not enough. We must also know what is now on this soil, and what man is doing with all this natural resource we call land.

Geographically, Wisconsin is wonderfully blessed. We have a climate and soil suitable to produce the very best forests, much mobile water, thousands of natural reservoirs, i.e., lakes filled with water to supply a steady flow, and with beautiful shore lines for summer homes, but management must be applied in other uses as it has in agriculture, and an inventory is the first step in management.

Land classification is not new. It is as old as civilization. The late Dr. Whitney of the U. S. Department of Agriculture, reports that, the Chow Dynasty of China in the 1122 B.C., appointed the

first minister of the land department, who was required to see that the land was properly distributed between crops and pastures; to see that the land suitable for culture was kept in crops; to teach the people soil adaptation, the care of tools; to see that the distribution of land was equitable; to spur the people to a system of intensive cultivation and the greatest possible use of the land.



Michigan has made great progress in taking a land inventory, having already covered 19 counties and in another four years' program, expects to cover 59% of the state.

Our method of taking inventory as we have started in Bayfield County, which we hope to complete this season, may be subdivided as follows:

- a. The soil is a basis.
- b. The cover, i.e., all natural growth and also farmland use.

- c. Wild life and water resources as well as mineral resources if any.
- d. What is the present status of man's relation to this land, or what has man done with these resources so far? This involves an inventory of ownership, intent of ownership taxes, value, etc.

You have before you one such map; we have prepared others. I cannot go into detail in explaining them to you, but from a close study it is evident that with facts like these before us, we can then act and shape our land program as a state and through individuals to secure the highest benefit from these resources.

For example, then science can aid us to produce at least a new supply of pulp wood in from 25 to 35 years on sites best adapted to the different timber associations, as set forth in this inventory. I say science because this inventory is very convincing to me that we must use efficient forest management to aid nature in bringing back our forests in time to meet our needs.

In conclusion, let me add that it is my conviction that civilizations have not failed because of over population but because people have failed to utilize through proper management their natural resources, which in the aggregate, we are want to call land.

Classification of land will mark the dawn of a new era in American civilization because it is the correlation of the various economic factors upon which rests the foundation of our free institutions and of the high standard of living characteristic of America.

## STATE ACTIVITIES IN FORESTRY

*By* NOBLE CLARK

(This statement was compiled in order that the reader might have in mind, as a background for the subsequent discussions, a summary of state forestry activities.)

**TREE NURSERY.** As early as 1914 the State Department of Conservation began the practice of propagating nursery stock for forest planting at their Trout Lake nursery, and this work has gradually expanded to the extent that in 1927 a total of 1,200,000 trees were distributed, at prices less than cost, to citizens of the state for forest planting purposes. The continued demand for tree stock of the broad leaf varieties for planting in the older well settled regions has



led the Conservation Commission to give careful consideration to the problem of soon locating a new nursery in the central portion of the state. It is important to have such a source for planting material that would be available earlier in the planting season than would be the case with material from the Trout Lake nursery, which is situated in the extreme north part of the state.

Already the new forest crop law has resulted in a greatly stimulated interest in commercial forest development on the part of cut over land owners.

**CONSERVATION COMMISSION.** The 1927 Legislature also re-organized the State Conservation Commission and gave it its present form. This was a step of basic importance not only to forestry but to all other conservation activities. The Conservation Commission has three basic features seldom combined in one body. First, it is a continuing, unpaid body, with overlapping terms aimed to encourage continuity of policy. Second, the Legislature has delegated to it broad regulatory powers, aimed to accomplish prompt action and to avoid burdening the Legislature with administrative detail. Third, the Commission has full authority to employ its own paid executives. This was aimed to encourage the building up of an elastic, competent, body of technical leaders and field employees. In effect, the Conservation Commission is organized like a board of directors of a corporation, whose function is to lay down policies and hold their own executives responsible for their execution.

The last legislature provided for a larger, stronger, and better equipped forest fire fighting organization. This year, 1928, we shall have ten organized fire prevention districts in northern Wisconsin, each supervised by a full time, well trained executive, who during the seasons of special fire hazard will be provided with many part time assistants, and "key men", or local community leaders. Seventy-two steel look out towers, so stationed as to make possible the early detection of fires, no matter where located, will aid greatly in the program of fire control, as will also much new fire fighting apparatus such as pumps, trucks and various other equipment.

**FARM WOODLOTS.** An extension specialist in forestry was in January, 1925, made a member of the staff of the College of Agriculture of the University of Wisconsin in joint co-operation with the State Conservation Commission and the Federal Government. This man has aided the farmers in forty-six counties of the state in the better management of their farm woodlots, and has estab-

lished demonstration forest plantations in thirty-two counties.

**COURSE IN TIMBERLAND MANAGEMENT.** In November, 1927, the first woodsmen's short course in timberland management was held at the College of Agriculture. So far as is known this was the first time that organizations engaged in the lumbering industry have called upon an educational institution to help train their employees in the actual details of their work. Those in attendance were experienced woodsmen who came for information in addition to what they had been able to obtain in the school of experience. The interest in the short course was such that there was a unanimous demand that the course be repeated, and already plans are being made for the second session which will be held in the fall of 1928.

**FORESTRY RESEARCH.** The University, through its College of Agriculture, is pledged to a program of forestry research. Dr. Raphael Zon, director of the United States Lake States Forest Experiment Station has been appointed non-resident Professor of Forestry, and will have general supervision of this research, most of it in northern Wisconsin. Projects that will receive early consideration have to do with the rate of growth following selective logging, the rate of growth following partial drainage, a study of fire hazards, and the beneficial effects to crops of windbreaks.

**ECONOMY SURVEY.** The State Department of Agriculture in cooperation with the College of Agriculture and the Wisconsin Geological and Natural History Survey, in 1927 instituted in Bayfield County a land economic survey that has as its goal the economic inventory of the northern Wisconsin areas that are faced with a lessened income because of the removal of the virgin timber. A careful survey is made by specialists in the fields of soils, forestry, agriculture, recreation, and land economics, and their observations are recorded on maps which portray the soil conditions of the area, its present utilization for agriculture or forestry, and its possibilities for these or other purposes. Such scientific studies should do much to guide the development of these areas along productive lines that are most likely to promise success, and it is planned to carry this survey to other northern counties.

**TAX STUDY.** Still another attack on the problem of finding out just what are the present conditions in, and the needs of, the northern part of the state, was involved in a detailed tax study of 19

northern counties which is just being completed by the College of Agriculture. This study shows the relation of land taxation to the present and probable future ownership and utilization of land in districts having large areas of cut over land. Financial data for certain of these northern Wisconsin counties also has been gathered which throws much light on the relationship of tax delinquencies, county owned tax certificates and the financial condition of the individual counties.

**Boys' Work.** The planting and protecting of forests contemplate a desired goal set in the years of the future, and for this reason, and others also, have a special appeal to the youth of our land. Recognizing this the College of Agriculture has lately made provision for the enrolling and instruction of the boys of the state in forestry projects. The work is carried on in much the manner of the well known boys' and girls' agricultural clubs. The members are called Junior Forest Rangers, and are given instruction in the planting and protection of trees. This junior work began in 1926, but already there are 600 boys enrolled in 20 different counties. This number will undoubtedly more than double in 1928. The boys planted 130,000 tree seedlings in 1927, and many of them have started small nurseries in which they are growing thousands of young trees for future planting.

**SCHOOL FORESTS.** The most recent development has to do with the formation of school forests. Areas of 40 acres or more adjacent to, or near, school houses are donated to, or otherwise secured by, a particular school, and are so provided as to insure that they remain in perpetuity the property of the school. Each year a portion of the area will be replanted, (if replanting is deemed necessary), the thinning operations carried out as required by the growing trees, fire lines kept clean and other good forest management practices kept up, by the school children under the direction of the forestry extension specialist from the College of Agriculture. There are many very desirable possibilities that should accrue from this school forest project when it is remembered that the hundreds of schools in northern Wisconsin not only touch the lives of the entire population of the area, but they also are most admirably distributed so as to serve as wide spread demonstrations of the possibilities of forest development.

## FEDERAL ACTIVITIES IN WISCONSIN FORESTRY

By L. F. KNEIPP

The present Federal forestry activities affecting Wisconsin consist of: Silvicultural Research (Lake States Forest Experiment Station, St. Paul) and Forest Products Research (Forest Products Laboratory, Madison). Taxation studies and co-operation in fire control, educational activities and planting is also being conducted. Establishment of a National Forest.

ESTABLISHMENT OF A NATIONAL FOREST. The redemption of the lost provinces of forestry, i. e. the 81 million acres of now unproductive lands, presents special and peculiar problems, for on these lands new forests, in large degree, must be built from the ground up by heavy initial investments which for long periods of time will produce little or no cash returns. To permit of Federal co-operation in this work of forest reclamation the Clarke-McNary Law provides that with the prior consent of the state, lands may be purchased by the Federal government and permanently administered as national forests. This provision is an extension of an elaboration of the so-called Weeks' Law under which the United States has purchased almost three million acres of land in the Appalachian chain from New Hampshire to Alabama.

The purpose of the United States in buying these lands is to restore them to a condition of maximum forest productivity by intensive management, planting, fire protection, etc.; to make them sources of permanent timber supply and bases for permanent wood-using industries and communities. As these processes go forward research and experimentation will develop and eventually the areas will be concrete demonstrations of the best principles and methods of forest management and thus examples to other owners of forest lands. There is no selfish purpose in this proposal, no cleverly concealed invasion of state powers, but solely a desire to contribute toward the solution of a problem of national concern which in some states is so staggering in its proportions that the probable maximum effort by the states and its citizens will only partially alleviate the situation.

The field of Federal forest ownership is found in those parts of the lost provinces which offer little or no prospect of private action or of county or state action. If private initiative or county or state initiative is able adequately to cope with the situation, there is no

need for Federal intervention. If, however, neither private, county, or state agencies are prepared to carry out the necessary and desirable steps then there is room for effective participation by the Federal government.

Wisconsin has its lost provinces of forestry in abundant measure. The estimated area of depleted and unproductive land seems to be not far from 10 million acres of which most is situated in a roughly triangular area based on the north boundary of the state and within which the acreage of improved farm land is at a minimum. There was a time when these lands supported a wealth of timber that was one of the glories of the state, but only pitiful remnants of that wealth remain today and little is being done to effectively replace it.

Nevertheless, these lands are a great potential source of wealth and social service. Their capacity to produce timber has been demonstrated and is unquestioned. They lie in relatively close proximity to what eventually will be probably the greatest timber consuming center of the nation. Developed as forests they will afford the means for outdoor recreation for which there will be increasing need as the population multiplies and the strains of modern existence increase. To the State of Wisconsin these lands are both a challenge and an opportunity.

Under the provisions of the Clarke-McNary Act a program of forest land purchases has been evolved which provides roughly for the acquisition of approximately two million, five hundred thousand acres in the states of Michigan, Minnesota, and Wisconsin. The so-called Woodruff-McNary Bill, which has passed both houses of Congress and may by this time have become a law, establishes a fiscal policy for carrying out this program.

The act of consent of the State of Wisconsin establishes a maximum area of 500,000 acres and requires in addition the consent and concurrence not only of the Governor, the Director of the Conservation Commission, and the Commissioner of Public Lands, but that of the county commissioners of the counties in which purchases are to be made as well. The determination of the extent to which Federal ownership of forest lands would be desirable in Wisconsin rests therefore with the state and county officials.

Preliminary and rather superficial studies have shown that in Wisconsin there are at least six areas within which the provisions

and purposes of the Clarke-McNary Law could be made fully effective. These are as follows:

1. An area of approximately 200,000 acres in Forest, Oneida, and Vilas Counties of which part is on the drainage of the Wisconsin River and where white pine, hemlock, and hardwoods are important types.

2. An area of approximately 150,000 acres situated in the extreme northeast corner of Price County with possible minor extensions into Iron County or Oneida County. This area is on the drainage of the Flambeau River and was at one time characterized by excellent stands of white pine, hemlock, and hardwoods.

3. An area of approximately 150,000 acres in Peshtigo and Oconto Counties principally of sandy plains type and supporting a typical pine stand.

4. An area of virtually denuded land, perhaps 100,000 acres in extent, situated in Bayfield County between Moqua and Iron River.

5. An area of approximately 100,000 acres situated in the eastern parts of Jackson and Monroe Counties. Primarily of the sandy plains type.

6. An area of approximately 150,000 acres lying diagonally across the southeastern corner of Douglas County and northwestern corner of Washburn County and the northeastern corner of Burnett County.

Only one of these areas has as yet been definitely proposed by the Federal government. That is the one in Forest, Oneida, and Vilas counties and thus far the consent of Forest County has not been secured. As to the others, they are merely possibilities.

The foregoing sketches briefly the Federal forest policy as laid down in the Clarke-McNary Act and financed in the Woodruff-McNary Bill, and the possible applications of that policy in a co-operative private, State, and Federal effort to solve Wisconsin's idle land problem.

THE LAKE STATES FOREST EXPERIMENT STATION is the Federal Government's effort to create a body of dependable facts about the growing and utilization of timber crops. The Forest Service has already established 11 regional forest experiment stations, including the Lake States Station at St. Paul. The activities of the Station extend to Wisconsin, Michigan and Minnesota. Its task is not unlike that of agricultural experiment stations except that it deals

with forest crops instead of agricultural crops. It carries on investigations into the nature of the different kinds of forests found in the region, their adaptability to certain soils, their growth and yield, and methods of securing their re-growth after cutting; it studies forest fires, their occurrences, causes and factors controlling their spread; it studies methods for planting up land that does not come up naturally to forest—from the collection of seed and raising forest nursery stock to planting out under conditions most adapted for the success of the plantations; it is co-operating with the College of Agriculture of the University of Wisconsin, particularly in a thorough understanding of the forest fire situation in the state, and in determining the growth that takes place in the hardwood hemlock forests after selective logging.

THE FOREST PRODUCTS LABORATORY at Madison, operated by the U. S. Forest Service in co-operation with the University of Wisconsin, is a national institution but is performing much research of direct importance to Wisconsin forestry. The Laboratory's function in a broad way is to so improve the processes of forest utilization that the full use-value of wood is realized. The three main phases of the Laboratory's research program consist in determining the physical and chemical properties of the many native species of woods, finding the requirements of various uses in terms of these wood properties, and adapting the one to the other as far as possible through scientific manipulation of growth and manufacturing processes. It is conducting experiments to develop better designs of wood products, better kiln drying and air seasoning methods, better preservative treatments, and better wood glues and fastenings; and it is carrying on studies to improve methods of manufacturing pulp and paper from wood and methods of logging, milling and lumber grading.

While the number of research units is nearly adequate, the present amount and stability of their appropriations is quite inadequate to deliver all the facts on which to build a complete forest policy. Hence the McSweeney-McNary Bill, now pending in Congress. This bill aims to do for forestry research what the Clarke-McNary Act is already doing for forest protection and administration, namely, to lay down an adequate program for the next ten years and to provide for its execution in co-operation with all agencies concerned.

NOTE: The State has received an average of approximately \$25,000 per year from the Clark-McNary fund for fire prevention and detection, an average of approximately \$2,000 per year for raising and furnishing of forest trees to farmers, and approximately \$1,500 per year for instruction of farmers and other landowners through forest extension work. The State has received assistance in setting up standards for forest protection and management. The Federal Government has assisted in forest research through the Lake States Forest Experiment Station, and the studies and investigations of the Forest Products Laboratory have been available to Wisconsin citizens and industries. There have been a number of times when, but for this assistance, a particular activity would have to be materially curtailed or abandoned entirely. The Federal aid has been of great consequence in the establishing of a forestry program in Wisconsin.—C. L. HARRINGTON.



### CHAPTER III

## WHAT FORESTS MEAN

### TO WISCONSIN

By WM. MAUTHE

Those of us who have been unfortunate enough to operate a plant on a capacity of about 25% could very easily answer our Dean Russell's question. As you know, our overhead expenses which include taxes, must be spread over the production. Where the production is only 25% of the capacity, we create a very high factory cost, a high factory cost means a high selling price, a high selling price means inability to meet competition from other states and abroad. So with the State, if its natural and industrial resources are only operated at 5 or 10 or 25% capacity, all of the expense of carrying on this State must be spread over that small production, and therefore it makes it more difficult to carry on industry in the State and carry on its activities if we find it difficult to meet competition. If we can increase the capacity of the State of Wisconsin we will find it much easier to meet all competition which includes world competition.

We are on our way. A good many are already on the job. The Wisconsin Conservation Commission is co-operating with the College of Agriculture and with the Department of Agriculture in its survey or inventory. It is fortunate in having the co-operation of the Izaak Walton League in this State and the men at the head of it and other outdoor clubs.

We must have a common understanding of what our program should be and in order that we may have a common understanding of what the program should be so that we can all work, we must know what forests really mean to the public. Dr. Zon told us that we are only spending a few thousand dollars to prevent fires and rebuild cutover lands. I wonder how many of you know that the only money that we can spend for such purposes are the balances that are left over from the fishing licenses that come into the State. It is indeed inspiring to note so many here who are connected with the management of various businesses and have their co-operation to the end that there shall be money spent other than those coming

from balances left over from fishing licenses. We need a substantial sum of money to carry on reforestation and especially the lumbermen will be interested in some program that will bring this about.

## TO THE PUBLIC

By ALVIN C. REIS

*First.* Forests at home mean cheaper lumber to the consumer. During the past eighty years the price of lumber delivered at the principal consuming centers has advanced three and a half times as fast as the average price of all staple commodities. Why? Is it because lumber companies have exacted exorbitant profits? Not necessarily. It is primarily because the cost of transporting the lumber has increased. Why has the freight gone up? Is it because the railroads and steamship lines have taken excessive tolls? Not necessarily. It is because the constant migration from one virgin forest to another has carried the source of supply ever farther and farther away from the average consumer. Seventy-five per cent of the country's virgin timber today is west of the Great Plains—most of it on the Pacific Coast.

Time was when \$2.00 per thousand feet was the freight bill on lumber shipped down the Hudson to New York. Today Panama freighters bring lumber 6500 miles from the Pacific Coast to New York at a charter rate of \$16.00 per thousand feet, plus \$2.00 or \$3.00 more for inland distribution by rail. Wisconsin pays a freight bill of \$10,000,000 on lumber imported into the state every year. As Colonel Greeley, to whom these facts are to be credited, says: "Not quantity but availability is the true measure of timber exhaustion. Lumber is steadily becoming more dear because the timber supply remaining is less and less available to the average consumer."

*Second.* Forests mean industry, while exhausted forest resources mean industrial decline, with consequent social decadence and exodus of population. Each of you has seen the wreckage of once prosperous little communities along Wisconsin's northern railroad lines. Once upon a time, booming lumber towns—mills humming, labor employed, capital earning a profit. Today, deserted villages—mills scrapped, retail merchant business stagnated, homes rotting, the schools abandoned, the people gone. Railroads through

the devastated territory either operate at a loss or tear up their tracks and cut off from service those residents that are left.

If it were economically sound for the advent of the plow and thresher to follow when the logging train and sawing machinery moved out, there would be no tragedy. But such is not history. Farming cannot catch up with the acreage of cut-over forest land. The fact is astounding that there is today in Wisconsin one acre of waste, deforested land for every acre of improved farm land. Almost as alarming as the growing tendency of agriculture to leave the land, is the time-worn emigration of forestry from the land. And it is time-worn. I quote: "Eight years ago the vast quantities of logs annually taken from the several lumbering districts were painfully suggestive of the time when 'EXHAUSTED' might have to be written across the entire chart of all our great forests . . . ." Those are the words of the secretary of the Wisconsin Agricultural Society in 1868—sixty years ago!

*Third.* Forests mean revenue to the government, particularly the local governments, in taxation, while depleted forests with resulting idle and unimproved lands mean approaching bankruptcy for many local communities. Taxable values of the deserted forest land shrink, even to nothing. Businesses that have gone along with the departing foresters are no longer at hand to tax. When lumbering moves out, the home owners who are left, together with such isolated tradesmen, if any, as may remain, must bear the tax burden for all.

A land tax of even ten cents an acre as provided in the recent forest tax law, on land actually devoted to forestry, is better than tax delinquency on a larger quantity of land. There are northern counties which, it is said, can barely meet their current obligations because the cut over land is slipping off the tax roll. One typical northern county which originally was wooded 95% with heavy pine and hardwood, is today 77% cut over wild land. These lands are forfeited for taxes. That county can be bought today for a song.

The yield tax is a logical tax measure. It is after all nothing more nor less than Wisconsin's avowed policy of income taxation. It is based on ability to pay. Waste land, growing nothing, has no ability to pay, and the only theory upon which a tax upon it can be defended is the single tax principle of driving it into production; but the boomerang from that philosophy is that rather than enter a non-profitable production, it will default in its taxes altogether and

thus cheat the government completely. The yield tax is an income tax on profits. Cut timber can well afford to pay a tax on profits. Without yield, however, it is self-evident that there will be no yield tax.

*Fourth.* Forests mean playgrounds. We hear of going to the northern Wisconsin woods. We who know those woods have the bitter realization that 12,000,000 acres, or practically one-third of Wisconsin—and most thereof in the northern half of the state—are burnt over brush, a desert of blackened spectres, mournful memory of Wisconsin woods that were. This state, once 84% virgin timber—once 30,000,000 out of its 34,000,000 acres covered with the primeval grandeur of trees—has today barely a million acres left which bear merchantable timber.

We need to hear the call of the woods again. This, from a commercial standpoint alone, means hundreds of thousands of dollars in annual tourist trade. People who come to Wisconsin to see majestic pine and hemlock stretching heavenward, are not content to gaze on charred stumps and gaunt black forest arms. I do not touch in this connection upon the allied conservation subject of forests in their relation to streams. Dr. Zon's masterful treatise on "Forests and Water in the Light of Scientific Investigation" would make any layman's contribution to the subject a gesture.

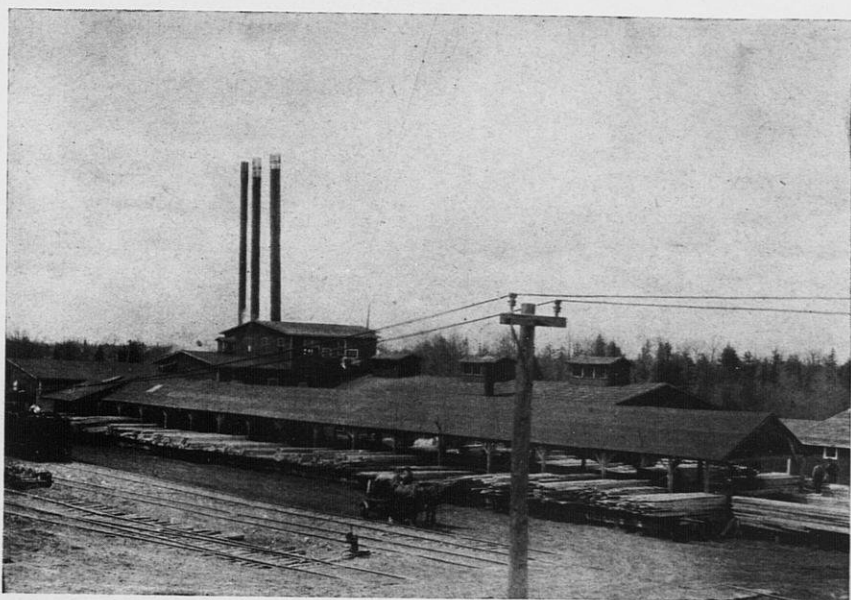
*Fifth.* Forests mean a state pride and state wealth. In 1899 Wisconsin was first among the forty-eight states in the Union in lumber production. We are proud today to be first in the Union in dairying. Yet, according to a report issued by the State Department of Agriculture in 1925, the Wisconsin products made wholly or largely of wood amount to more in total value than the combined value of all her dairy products.

Where is our wood coming from? Wisconsin—once greatest of all in lumber production—is today importing into the state one and one-half times the amount of lumber that she produces! We are paying as much annually to meet this balance of trade against us as it costs to run the entire state government in Wisconsin, all her departments and commissions, courts, charitable and penal institutions, university, normal schools—approximately \$30,000,000. Our citizens are handing out their money to enhance the wealth of other states and robbing their own people, their home industries, to just that extent. It would mean much to the public in Wisconsin to



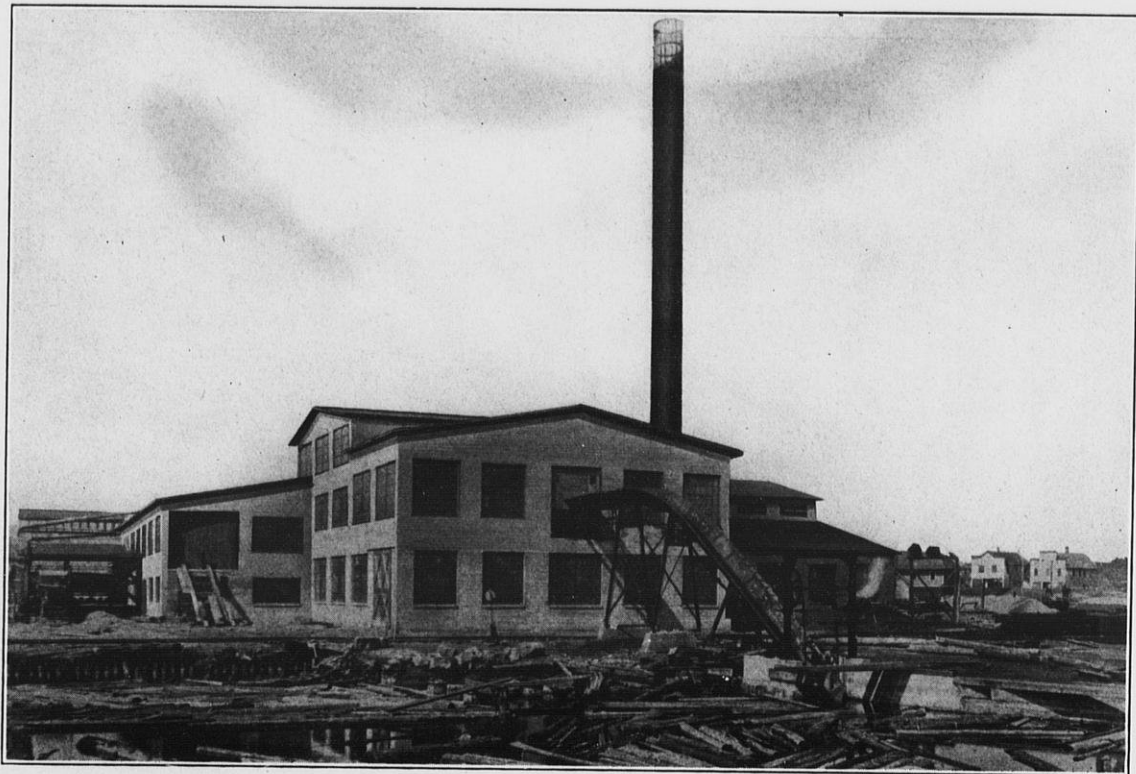
#### NORTHERN HARDWOOD LOGS

Birch, Maple, Basswood and Elm are the most valuable hardwoods of Wisconsin and Michigan.



#### A WISCONSIN SAWMILL

Note absence of refuse burner—all by-products utilized; also long sorting shed in foreground indicating the refinement of grades and species to suit consumers' needs.



INDIAN OWNED SAWMILL, NEOPIT, WISCONSIN

Steel and concrete construction, electrically driven, built for permanent operation under sustained yield. J. P. Kinney, Supervisor of Forests, Indian Service, Department of Interior, approves selective logging of Menominee Reservation timber amounting to 850 million feet. Photograph furnished by Prescott Company, Menominee, Michigan.

get back for this great state a part of the glory that once was ours in that splendid and inspiring task: Forestry.

## TO THE LUMBER INDUSTRY

By M. P. McCULLOUGH

In stating what our forests mean to the lumber industry, I am also presenting briefly what the lumber industry means to our forests. The two are inseparable, they move hand in hand. This is what Forester Greeley meant when he said that the use of wood will conserve our forest resources.

The lumber industry is entirely dependent upon the forests for its raw material and the location of its saw mills must be within a reasonable distance of the timber. Wisconsin forests brought the lumber industry to Wisconsin in the pioneer days and our superior Pine timber developed the industry speedily to the leading State in lumber production. From 1890 to 1900 the Lake States produced more than one third of the Nation's lumber supply, but in 1900 production in this region began to decline and it was very generally thought that within twenty years the forests here would have given way to agriculture, or game cover, and the lumber industry would have practically disappeared from this region. With declining production of Pine the more valuable hardwoods have been cut which has brought into the State many varied woodworking interests that, like the saw mills, needed to be near the source of supply for their raw material. We are still producing lumber at the rate of approximately one billion feet a year. We are still saying, that twenty years from now Wisconsin's forests will be cut out and the lumber industry gone.

The harvesting of the saw timber and merchantable pulpwood from our mixed timber forests of Wisconsin and upper Michigan does not of itself destroy the forests. Our logging requirements do not destroy the young growth. It is what follows logging, the slash fire, the desire to get rid of the forest cover to clear the land that is responsible for the disappearance of the forest, because agriculture offered a more profitable use for the land. When it developed that agriculture no longer wanted more land in certain areas the lumbermen gave no serious thought to using it for the growing of trees because the taxes and fire risk were too great for this long time en-

terprise. Now there comes apparently a situation in which equitable taxation of timber and adequate fire protection, together with no other demand for the land, make it worthwhile to preserve the forest cover left after logging the merchantable timber. Therefore, instead of repeating the saying of the past that we have only twenty years more of life for the lumber industry in Wisconsin, we are beginning to say the lumber industry will last as long as the forests.

The lumber and paper industries, by creating a market for forest products, will under these new conditions insure a profitable return to the forest owners in Northern Wisconsin and upper Michigan for three important reasons: first, nearness to market; second, local industry; and third, the tax budget.

Nearness to market: The saw mill must be located where the timber grows. It will stay here in Wisconsin as long as there are forests of growing timber, and will pay the owner for his timber the same price as is paid timber owners of the West or South for equally accessible timber, plus the difference in the freight rates from our mills to these markets, amounting to about \$3.00 per thousand feet. (After taking into consideration differences in logging and manufacturing costs of the two regions.) Wisconsin's forests therefore mean to the lumber industry, because of their location of a thousand miles or more nearer to the consumers, fully \$3.00 per thousand more in value than the competitive forest of the West and South.

Local industry: Statistics furnished by O. T. Swan indicate an average expenditure by our Wisconsin saw mills in logging, manufacturing and shipping, for wages alone of \$20.00 per thousand feet of lumber sold. If these wages are paid in Oregon or Louisiana, they will be spent in Oregon or Louisiana, but if paid in Wisconsin, they will be spent at home. The employees of the lumber industry in Wisconsin have an annual purchasing power of twenty million dollars. The raw material of the lumber industry is saw timber, but in its logging and milling operations it is a large purchaser of supplies. The extensive use of horses during the Fall and Winter give the settler and farmer a much needed income while there is no work at home and in addition the local loggers purchase practically their entire crop of hay and oats and much other farm produce. Many of our Northern villages and small cities are entirely dependent upon the saw mills for their existence. Mr.



Swan's figures indicate that \$6.00 is expended in local purchases of supplies for every thousand feet of lumber produced.

The Tax Budget: The cutting out of the merchantable timber necessarily removes it from the tax roll, but if the forest can be maintained so that there will be a future timber crop available, the saw mill and the industrial community becomes a permanent source of tax revenue. Based upon the average returns for eleven Wisconsin firms manufacturing 200 million feet of lumber a year, the taxes on the mill improvements and equipment, the logging equipment and the lumber inventories including real, personal and state income, average \$1.45½ per thousand feet of lumber produced. This on one billion feet means a tax revenue from the industry, exclusive of timber holdings, amounting to \$1,455,000.00 annually which is kept within the State so long as our forest resources are maintained, but which will be very largely paid out to some other region if our forests disappear.

## TO THE PAPER AND PULP INDUSTRY

By F. J. SENSENBRENNER

Prior to 1870, practically all the paper manufactured in this country was made from rags and straw. With the discovery of chemical and mechanically grinding processes for manufacturing pulp from wood, this condition was radically changed, so that for some years past, upwards of 90% of all the paper manufactured in the United States has been manufactured from woods. According to Mr. Goodman, our annual national production of forest products is fifty-two billion feet. Although the paper industry consumes a comparatively small per cent of that vast total, it does consume a much larger per cent of the annual cut of such woods as have up to date been found suitable for pulp and paper manufacture.

In 1926 the paper and pulp industry of the United States consumed 652,000 cords pulp wood more than in any previous year of its history; it consumed in that year a total of 6,766,007 cords, of which 1,276,490 cords was imported. In addition, we imported pulp in the production of which was consumed 3,158,000 cords, and we imported paper, in the production of which was consumed 2,650,000 cords. In other words, if in 1926 United States mills had manufactured all the pulp consumed by the mills of this country in the manufacture of paper, we would have consumed 9,924,007 cords,

and if United States mills had manufactured all the pulp necessary to produce the paper *consumed* in this country, we would have consumed 12,574,007 cords.

In view of this the paper industry is vitally interested in the conservation of our forests and reforestation. The manufacture of paper ranks seventh in the industries of the country. It has capacity to produce twelve million tons annually, valued at upwards of one billion dollars, and represents a capital investment of \$1,500,000,000. Paper manufacture ranks fourth in Wisconsin's industries, with an annual output valued at \$120,950,000, an annual payroll of \$23,400,000, and a capital investment of \$130,000,000.

Another industry, one which is absolutely dependent on the paper industry, viz. the printing industry, also has a vital interest in this subject. To give you some idea of the magnitude of the printing industry, may I submit the following: According to Ayres directory, the total number of publications of the country is upwards of 25,000. This includes daily, weekly, semi and tri-weekly newspapers, magazine, Farm Journals, fraternal, labor, class and college papers. The value of the annual product of these establishments must be vastly greater than the paper industry.

According to a writer in a recent issue of the magazine, "Plain Talk," 2,000 dailies with 541 Sunday editions and with a circulation per issue of 36,000,000, had an income in 1927 from advertising alone of \$750,000,000, and if we stop to consider that 59 national magazines in 1926 had a total circulation of 656,617,648 copies, and 55 national magazines in the same year carried 25,085,500 lines of advertising, it is easily conceivable that including the other 23,000 periodicals, the total revenue from advertising and circulation was upwards of \$2,000,000,000 in 1927. This does not include the great number of establishments printing catalogues, law books, school books, fiction books and an endless number of other media carrying the printed word.

In 1911 news print paper was put on the free list. The Canadian government wisely, through offers of abundant supplies of raw materials and water powers of ample capacity at attractive rates, encouraged the building of news print mills in Canada, with the result that Canadian manufacture of that commodity rose from 350,000 tons in 1913 to the vast total of 2,087,000 tons in 1927, and Canadian exports of news print to the United States rose from 55,830 tons in 1913 to over 1,800,000 tons in 1927. In 1926, for the first time in

history, Canadian production exceeded that of this country by 196,000 tons, and that lead was increased in 1927 to 600,000 tons. This latter increase was accomplished by an increase in Canadian production of 200,000 tons and a decrease in United States production of 200,000 tons. The decrease in the United States production was due in part to turning mills from the manufacture of news print to other grades, and in part to the permanent shut down of some mills.

When mills now in course of construction in Canada come into production, Canada's lead will be substantially increased and the situation of the United States mills will become increasingly serious, especially such mills which, through lack of capital or other causes, have not protected their future by investments in large stands of timber. In my opinion, if forty years ago the nation had adopted a broad and abundantly financed policy of conservation and reforestation, much of the shifting of the industry to Canada would have been deferred if not entirely avoided.

## TO THE RAILROADS

*By H. S. LARIMER*

Ever since railroad lines of transportation were established, the railroads have been dependent upon the forest and forest products for a great many of their essential necessities. For years after the Civil War wood from the forest provided the only fuel used on the railroads, but of course, modern invention and improved mechanism and the discovery of coal fields and the economical operation of them has relegated wood as fuel into the background and the old wood burner is a thing of the past.

Even in this day, in spite of all of the improvements made and the substitution of wood by metals and other products, the railroads are forced to go back to the forest for many of their necessities and if there were no other reason for the encouragement of the railroads to forward a movement of this kind, the necessity for the tie is sufficient unto itself. The old wooden tie still reigns supreme. We have had a good many substitutes and many of them have been tried out, but nothing yet has been developed which will take the place of the wooden tie in railroad construction and in this region, what has been a rich region of forest products, it seems a shame that a perpetual source of tie supply won't be provided for railroads in our

own territory. It will be impossible to get ties out of this region in fifteen or twenty years. We already have to go far afield for our supply. We find buyers from the East up here in our territories taking ties that naturally should go to roads operating in this region.

In addition to ties, you all know there are many necessities of railroads and construction and equipment which can only be provided for out of the forest products, but probably the most compelling reason of all for the support of the railroads to any movement that will bring about the perpetuation of forests and continuous operation of them is the question of freight revenue. To indicate the important part that forest products play in modern industry and the direct bearing they have on transportation, according to President Sargent, the railroad freight tonnage for 1926, the last year for which these figures are available, was for the United States approximately one and one-quarter billion tons. Of this total amount, products of the forest were one hundred million tons. This one hundred million tons was two and one-half times as much as the total tonnage of wheat and corn; almost four times as much as all the cement shipped, and fifty per cent more than the iron ore; refined petroleum and its products equalled just about one-half the forest products tonnage.

The railroads have enjoyed this revenue for a good many years and they can ill afford to lose any part of it. Agriculture is not keeping pace with the cutting out of the forest and other industries have not come in to take the place of the timber industry. Most of the lines of railroad up in this country were started as logging spurs, reaching out into timber and as the cutting developed, sawmills sprang up and communities surrounded the sawmills, calling for the transportation of necessities of life and of material for the logging operations. In return the railroads carried out the logs and forest products from the mills. We have all seen the dismantling and complete abandonment of many of these sawmills and as a consequence of that, the dwindling away of these communities.

The railroads are interested in a movement of this kind, not alone from the standpoint of freight and materials, but from the standpoint of recreation as well. Nature intended that all of this northern region should be forested and provide a place of refuge and recreation for those who want to get away from the cares of a busy life. The railroads realize a very substantial return from this exodus from populous regions. No more desolate picture can

be presented to any passenger on a railroad train than the picture of cutover, devastated regions of Northern Wisconsin. Any movement that would bring back the forests that we all remember so well into these denuded regions would receive the sincere support and encouragement of the railroads.

## TO HYDROELECTRIC POWER

By M. H. FRANK

In developing a hydroelectric power on any stream, one of the first things that must be considered is the minimum flow in that stream during the low water period. It would be impractical to make a development of a greater capacity than the above minimum flow unless a steam plant or other sources of power were available to make up the deficiency in power between the average capacity of the development and the capacity at minimum flow. Supposing a development has sufficient water with a given head to develop 1000 H. P. three hundred and sixty days in the year, and measurements have shown that on an average there are five days in each year when the stream was so low that it would only develop 500 H. P. This would indicate that the owner would be justified in spending considerable money, to build a reservoir or to develop some means of stream control, or else to provide a steam plant as a standby, for the above five days.

While the most common method of stream flow control is by the construction of dams to impound water in reservoirs near the head of the stream, another method is through the use of forests. Throughout the country statistics show that the stream flowing through wooded territory has a very much more uniform flow than the stream which originates or flows through barren territory, even though the rainfall is the same in both cases. Records also show that there is a greater amount of precipitation annually in a forest covered territory than in a barren territory, other conditions being equal. Various authorities claim that experiments that have been made show that there is from one to twenty per cent more precipitation over wooded areas. This is due to several reasons:

*First:*—In mountainous territory or with rain clouds close to the earth the foliage has a tendency to condense out the moisture in the air. The foliage also has an effect on the temperature and air cur-

rent, which in certain cases has a tendency to cause a precipitation over the wooded area greater than the amount over the barren area.

*Second*:—Forests retard the run-off, that is, there are more obstacles, more porous material on the ground, which tend to slow up or retard the run-off after a rain. In the case of snow the blanket is uniform over the entire wooded area and in the spring does not melt off as rapidly as when exposed to warmer weather, winds, and rain. This will have a tendency to knock off or reduce the peak of the freshet, which generally occurs after a big rain or spring thaw. In addition the wooded area will hold a considerable amount of moisture for many weeks, and let the water run-off very gradually as compared to the barren unwooded area, which completely drains off and dries up soon after a rain or spring break up.

In the summer time, the forest has a tendency to protect the moisture which is in the porous soil covering from the sun and thus reduce its rapid evaporation as compared to the exposed areas. This would indicate that least a portion of the water which is not evaporated in the timber covered area eventually finds its way to the stream, and has a tendency to help the stream flow during dry weather periods.

Probably the most important advantage of forests to hydroelectric development is that they reduce stream bed erosion. Seldom do we see a big washout in wooded areas. The retarding effect on the freshets, and the binding together of the top surface of the soil bed has a tendency to protect stream flow channels. This prevents the deposit of large volumes of silt in the main stream bed or in the natural or the artificial reservoir. In a number of cases this has been very serious. One case has been called to our attention recently where the Austin Dam on the Colorado River at Austin, Texas, created a reservoir which had a capacity of approximately 225,000,000 cu. ft. in 1890. By 1927, this reservoir had been reduced so that its capacity was only five per cent of the original capacity. Had the banks of this stream and the territory drained been protected by forest this reservoir would undoubtedly have lasted many, many years longer.

During the last few years we have come to realize the need for and the advantage of protecting the scenery along our streams, and the importance of the general appearance around hydroelectric development and the shore line. This is not only true of hydroelectric developments, but of steam power developments and industrial de-

velopments throughout the most modern and up to date sections of our country.

Business men generally are beginning to realize that it not only makes their property more attractive, but that it is in addition, simply a matter of good business and good judgment, in that, it reflects competent supervision and efficient operation of that particular property.

In a number of cases at the present time hydroelectric plant operators on their own initiative have planted and have encouraged the planting of trees along the shore line in the drainage area of the stream, and also around the development with the idea of improving the general appearance as well as the operating characteristics of that stream. Within the last couple of years The Wisconsin Power and Light Company has encouraged the planting of over 50,000 trees along the shore line and drainage area of the Wisconsin River. Another hydro development on the Red River reports that over 150 trees have been planted around the plant in order to improve the general appearance. On another development on the Wolf River a number of large trees were moved from the area to be flooded and placed around the development in order to protect the bank of the stream and to improve the general appearance.

In conclusion, forests are very valuable to the hydroelectric development; they furnish protection against erosion, and they retard the freshets thus making the stream flow more uniform. With the new laws and the encouragement of the Conservation Commission, many hydroelectric plant owners will doubtless take steps in the near future to reforest their non-productive flowage lands, thus making them more valuable both from the standpoint of stream control and of timber production.

Consideration will be increasingly given to the fact that trees are an asset to the old, as well as to the new plants—that they should be saved when making new developments—that they should be planted wherever there is an opportunity—and that they should be protected wherever they serve a useful purpose.

NOTE: William M. Dinneen, Secretary of the Railroad Commission of Wisconsin, estimates that the installed water power capacity within the State and one-half of boundary streams aggregates 470,000 H.P. and that these plants operate for 50 per cent of the time at about 430,000 H.P.; and that these installations represent an approximate investment of \$73,000,000 and generate over 1,354,000,000 kwh valued at 0.6¢ per kwh at plant switchboard

\$8,100,000. The annual tax is estimated at \$1,600,000. This represents a development of about two-thirds of the State's economically available water power resources.

## TO RECREATION INDUSTRY

By BURT WILLIAMS

"Wisconsin has more fresh water frontage than any other state in the Union." This unqualified and emphatic statement by Dr. James Alexander Hentschell shows that as far as water resources for recreational purposes are concerned Wisconsin surpasses any other state in the Union. In the heart of the average American today, be he farmer, or city dweller, there rests the hope and plan for an annual vacation, and when we consider that vacation planning is always waterward, we can appreciate the opportunity Wisconsin possesses in building perhaps a greater recreational industry than any other state, particularly when Wisconsin's fresh water frontage is located in the very heart of America, near the centers of congested population.

Wisconsin is just at the beginning of its development of this great industry. When we consider that the accurate and very thorough surveys made by the Wisconsin Highway Commission last year showed that in three months time last summer over a million tourist cars, carrying over four million people came into Wisconsin, and that these tourists in that short space of time spent over one hundred million dollars in this state, then realize that we are just at the beginning of building this business in Wisconsin and we can see the possibilities of progress and prosperity for Wisconsin in this direction. Fresh water frontage, however, fails to possess its real and irresistible attractions without forests.

Down in southern Wisconsin, near the borderline of Illinois, is a small lake. Around this body of water, which is not longer than half a mile, practically 6000 small platted lots were sold for a considerable distance away from the shoreline. There is scarcely a tree to be seen. I visited this recreational development last summer, and the most noticeable thing that attracted my attention were the signs "For Sale" that hung on the great bulk of the small summer cottages. These signs told the real story, dissatisfaction with an environment which did not contain the shade of trees. Today



the most popular recreational developments that can be found in Wisconsin are those where there are trees and forests, which add so measurably to fresh water frontage. The recreational industry has taught Wisconsin people one great lesson, the value of forests in building this type of business for our state.

Twenty years ago it was proposed to set aside a good many thousand acres in the heart of Vilas County for a state park, such park to include large tracts of trees which were to remain forever uncut because they were to be dedicated to park purposes. This plan aroused the greatest of antagonism among the people of that section. They considered that it would stop agricultural development, and would keep in a forest covered area thousands of acres of land that would otherwise be converted into profitable farms.

At this time it would be hard to find any resident of Vilas County who is antagonistic to this park project, and the people there today commend most earnestly the vision of a few men who had the courage a score of years ago to fight and save the forest that still remained within that proposed park area. The virgin forests that stand on these state lands, the cutover acres where evergreens, poplars and other trees are rapidly and naturally propagating themselves, are now recognized along with the lakes in that section as the biggest asset which Vilas County contains. There are now 180 summer resorts in Vilas County. Each of these resorts gives accommodations for from 20 to 200 people. The average cost of these resorts at a conservative estimate is \$20,000. This means an investment of nearly four million dollars in summer resort property. A banker at Eagle River told me two years ago that he could trace 95c out of every dollar passing through his bank to the recreational industry that has developed in that county, and if the forests of Vilas County were gone the recreational business of that region would be dying off rapidly, instead of growing by leaps and bounds.

In Oneida County there are fully 50 summer resorts. The 214 lakes within a radius of 12 miles of Rhinelander are bringing so much business to that territory that where a few years ago the entire plan was to remove the forest and create farms, there has developed a realization now that forested lake areas will bring more tangible wealth to that community, through recreational development than through any other project. County Superintendent of Schools J. M. Reed has put into all of the schools of that County the first complete course of conservation and forestry that has been established

anywhere in Wisconsin. The recreational industry of Wisconsin has taught communities in the North, that a forested area will bring constantly increasing returns through its use for recreational purposes, while from a lumbering standpoint, when the crop is once removed, idle and unprofitable land often remains.

In Sawyer County, just a few years ago, the sentiment was for the removal of the forests to provide employment for labor in the logging and lumbering business, and the creation of farms. In many places the forests have gone but the farm development has been very slow to find its place. But where the forests remain, the people have found that such territory brings more money through recreational development than could be secured by any other business proposition. Five years ago, two settlers trying to plant potatoes among the stumps, saw several automobiles going by their places on a road in Sawyer County. One of them remarked to the other, "What are these poor fools coming up into this God forsaken country for." These two men, and most of the other inhabitants, realize now that there is an insatiable hunger in the hearts of most city dwellers for these God forsaken wild places with forest as a combination to water frontage. Such spots are the most favored of all in the Middle West for the millions of people who are tired of the "din and the sham of city life, and who find pleasure in the pathless woods and rapture on the lonely shore." The wild and isolated forest regions of Sawyer County are the richest blessings now of that section. Many summer homes and camps of representative men throughout the Middle West can be found there, and in one place a large club from the electrical workers union of the city of Chicago have established a summer recreational center 400 miles away from the city in which they work and live. The Hines Lumber Company of Park Falls together with the John S. Owen Lumber Company of Eau Claire owned a tract of 10,000 acres of virgin pine forests west of Phillips. Three times the legislature of Wisconsin has appropriated the money to buy this tract to preserve it for public purposes, and three times a Governor of the state has vetoed such bill. It was thought that lumbering operations would soon start again in this great stretch of virgin timber. Recently the Hines Company purchased the holdings of the John S. Owen Lumber Company in that body of timber. It has ceased all lumbering operations in the tract and placed the property on the market for recreational purposes. Virgin forests like that have a higher value

for the health, pleasure and play of American people than its worth according to lumber scale. American Legion Posts, fraternal societies, sportsmen clubs, schools and other organizations, find at the present time throughout Wisconsin their greatest and most fruitful occupation in making plans for the planting of trees and forests.

One Sunday afternoon last summer I drove out from the city of Chicago. On one of the highways about ten miles north of that city I noticed a field where there was a little grove of straggly, weak and poorly developed trees. In that little grove I counted several hundred people who were trying to find rest and recreation out in the open air, with the leaves of those few small trees to protect them from the sun's rays that hot Sunday afternoon. Having lived in Wisconsin all of my life, having known and appreciated the beauties of the magnificent virgin forests that this state has been blessed with, it came to my mind then more forcibly than ever that Wisconsin people have little appreciated the real value of forests as permanent resources of our state, and that it is the tired recreational seeker from the big cities that is really teaching us to know the worth of the tree. That group of people under those few trees in that little campsite out from Chicago, were paying the highest kind of tribute to the forest, for in their hearts was unquestionably this sentiment.

"The kindest thing God ever made  
His hand of very healing laid  
Upon a fevered world is shade.  
Green temples closed against the heat  
Of noon time's burning glare and beat,  
Open to any Pilgrim's feet  
This is God's hospitality  
And whoso rests beneath a tree  
Has cause to thank Him gratefully."

## TO RESORTS

By H. L. ASHWORTH

Preservation of Wisconsin's forests is a matter of vital interest to the resorts of Wisconsin and the resort operators are being asked to pledge their co-operation to the reforestation movement. There are several hundred resorts scattered over the north-woods district of Wisconsin and the natural beauties surrounding them are re-

garded as one of the big assets in attracting tourist business for this state.

Many resort operators showed their interest by attending the Commercial Forestry Conference and a permanent reforestation program is assured co-operation from resort interests.

An organized effort to promote Wisconsin's recreation facilities is being conducted under the direction of the Outdoor Club of Wisconsin, which was formerly known as the Land O'Lakes Association. This organization maintains headquarters at Wausau and is now carrying out a plan to consolidate the efforts of all interests in the promotion of the state as a tourist attraction. The commercial hotels of the state are likewise pledging their co-operation to the movement.

Obviously the future of Wisconsin's northern resorts is tied up closely with forestry.

## TO OUTDOOR ORGANIZATIONS

*By* WM. J. P. ABERG

Many are inclined, in referring to outdoor organizations, to limit their scope and interests to Sunday picnics or fishing trips. The Izaak Walton League, particularly in Wisconsin, has interested itself in all phases of conservation. It has played a very active part in furthering the creation of a national forest in this state. It has been responsible for the creation of the greatest fish and game refuge in the United States in the Winnesheik Bottoms. It has taken an active part in the framing of the forest tax laws.

All of these activities have been, and are being conducted with a full realization that the day of the primeval wilderness is a thing of the past, and that we must work toward the creation of a substitute. Even in those sections which still have the appearance of wilderness, the trespass signs are increasing in frequency and if the land be privately owned, there is no plausible excuse for disobeying them. If the present tendency continues long, there will be no areas open to the man who wants to get into the woods except publicly owned or controlled forests and parks.

We have in Wisconsin today, a little over 181,000 acres in state refuges, of which area 88,400 acres is in the form of state parks. We have 36,000 acres in private game refuges or a total of 217,840

acres of refuges and state parks. This seems like a substantial area if used only for recreational purposes. As the population increases, working hours decrease, and the demand for recreation is constantly growing greater. Where the artisan of not more than ten years ago never gave thought to vacations or outdoor recreation, he is today demanding at least a couple of weeks per year and with easy access by automobile to all parts of the country, his first thoughts are of the forest. Instinctively the forest is always considered the seat of all out-door recreation.

The use of the forest for recreational purposes is as inseparable from the use of the forest for utility as is the utilization of hide, horn and hair in the packing industry, where meat pays the expenses and the net profits come from the by-products. I do not mean to say that forests will not be self-sustaining because we know full well in Wisconsin that forestry for commercial gain will stand on its own feet. But certain it is that fish, game and forests, which serve the needs of an outdoor seeking people, will be of ever increasing importance to the profitable utilization of our cut-over and swamp land areas.

Those who know tell us that the income from tourists alone in Wisconsin is \$100,000,000 a year. That is a gross income of \$3.00 per year for every acre in Wisconsin, and these tourists do not come to see our farming lands or to inspect our hogs and cattle. They come to our lakes and streams and mainly in the Northern half of the state, which raises only ten per cent of the hogs and they will not come when our forest lands are barren. The return is tangible and dependable. Forestry is a necessary essential to it. The state and county forests in particular, can in a relatively short time in many of our Northern districts, increase the earning power and taxable assets of adjacent property if they but set about doing it. Forced acquisition by the delinquent tax route will make necessary adequate use of lands acquired.

The tourist who comes to enjoy our scenery buys the only crop we have which the consumer comes and gets, makes his own delivery, and leaves as much, when he has used his fill, as there was before he came.

Recreation is the one word that expresses the use of the out-of-doors by outdoor loving men. Those of us in this state who are interested in commercial forestry should not fail to give to recreation its full due. We must bear in mind that to date recreation has fur-

nished us with all of the state forestry which we have had, and it is at the present time furnishing the only means of revenue which we have for state forestry work. Recreation pays for our fire protection and suppression. It pays for our reforestation. It pays for our refuges and, in fact, for all of our conservation activities including the payment of bounties for killing wolves which are supposed to kill the farmers' sheep. In 1926, our total state revenue from fishing and hunting licenses alone was \$401,550. For 1927, that sum was something over \$463,000 and for 1928, the figure will probably run over a half million dollars. With a resident fishing license which must come in time it should exceed a million dollars. This money, gentlemen, is all that we, in Wisconsin, with our vast resources of lakes and streams and potential forest areas, have spent in the development of our out-of-doors. It has all been furnished by the fisherman and hunter, and in the face of these facts, we meet well intentioned legislators who inquire what business these Izaak Walton League representatives have interesting themselves in conservation legislation. It is only a little over two years ago that our Governor tried to saddle on the hunter and fisherman, who pays for all conservation in Wisconsin, the burden of paying interest on moneys illegally used from school funds for a reforestation project which failed some fifteen years ago.

So in closing, permit me to reiterate that the forest means everything to the outdoor man and to the outdoor organization, and both the man and the organization are increasing in number. It means protection and cover for the game he loves to hunt, and protection for the fish which he finds it more difficult each year to catch. It offers spots of scenic beauty where quiet rest and tranquility can be found. For these reasons, your program is our program and we will help create and maintain the forest and keep it free from devastating fires.

## TO MILWAUKEE

By DANIEL W. HOAN

Milwaukee realizes her dependency upon the state of Wisconsin and surrounding territory and we appreciate the fact that perhaps there would be no Milwaukee were it not for the State of Wisconsin and the productive forces in the State and in the surrounding ter-

ritory. We surely are appreciative of the fact that vast acreages of land that is barren and unproductive in northern Wisconsin have a direct bearing and economic significance to our city of tremendous importance and for you men together here to take up this subject is certainly appreciated by the citizens of Milwaukee. If I know anything about this conference, it is going to take forestry out of the realm of theory and preachment and put it into action in our State. It has been my humble experience, that when we can get the solid business of the city and state interested, sell a project to them, the time for theorizing is about to pass.

There are a great many cities that have not seen the significance of looking about them to find what their natural resources are. Some cities are surrounded by barren wastes of land, as in northern Wisconsin. In some of these smaller places they sit about in the winter, spending the long winter evenings telling stories, sometimes about each other, and waiting for some other community to pay their taxes. Those lands are the natural resources of such communities, if they are not fertile farm lands, or if they cannot be used as farm lands, the sooner those communities take interest and reforest those lands, the quicker they will begin to reap the benefits of one of their most important natural resources.

Some cities are surrounded by farm lands, others have the advantage of water, others coal mines located near them, but our northern Wisconsin is naturally adapted for the raising of trees and when they attempted not only to cut down the trees, but to convert sand land into farms, somebody had to pay the penalty, and we are paying. If thousands are losing their farms, cannot pay taxes and live and get along, it is simply because we misconceived the purpose of those lands and the quicker we get busy to put them into natural use, the better it will be for all, and we expect some such action to result from this conference.

The City of Milwaukee has taken some interest in forestry. About nine years ago we established a forestry division in the Park Board and under that division they have charge of all trees between the curbs and sidewalks and in the public parks and grounds. Our trees were being infected by moths and disease and the first thing that division did was to spray the trees each year and today that disease has been so effectively wiped out it is no longer seen with the naked eye. We took charge of planting new trees; this division planted three thousand a year, taking charge of the trimming of these

trees, and removing of dead trees, so today I can proudly say Milwaukee leads every other city in America in forestry work and I heard today that Milwaukee County is third of all the counties in the United States, that is, there are only two other counties in the United States that are ahead of Milwaukee County in its forestry activities. We know that a vast acreage in our State is nonproductive and the quicker it is made productive, the better for every living soul. We know there has been much theorizing and much preachment. This, I understand, is the first State to prepare a practical program on forestry from the standpoint of the businessmen of the State.

## TO MANUFACTURERS

By GEORGE F. KULL

Wisconsin's lack of foresight in the matter of reforestation has been nothing less than inexcusable neglect of a situation that now reflects itself in the pocketbook of every citizen of our state. The ramifications of forestry can be traced throughout society. Directly or indirectly, practically every line of industrial endeavor is affected by the status of our forest problem.

No other product of the soil enters more largely into the industries of the world than timber. The so-called wood industries are, of course, most vitally concerned. Their very existence depends upon a continuous supply of wood. As their raw material, they represent a combined investment of about \$255,000,000. They create one-fourth of all our merchants' trade and one-fourth of all our banks' business.

### WISCONSIN'S WOOD USING INDUSTRIES

Number of manufacturing establishments.....	791
Combined investment.....	\$255,000,000
Annual production.....	174,000,000
Annual taxes (about $\frac{1}{4}$ of all our taxes).....	38,742,000
Annual payroll (estimated).....	55,000,000
Annual freight (about $\frac{1}{4}$ of all our railroad revenues)...	33,026,000
Number of wage earners (about $\frac{1}{4}$ of total for all industry) .....	65,000
Number of persons dependent (about $\frac{1}{8}$ of Wisconsin's population) .....	325,000



## LUMBER CONSUMED BY WOOD USING PLANTS

Number of exclusively wood using plants.....		731
	<i>Bd. ft.</i>	<i>Bd. ft.</i>
Box factories.....	167,000,000	Furniture factories..... 80,000,000
Sash and door plant.....	150,000,000	Woodenware plants..... 44,000,000
Planing mills.....	70,000,000	Excelsior plants..... 21,000,000

## FOREST INDUSTRIES OF WISCONSIN

LUMBER AND TIMBER PRODUCTS		FURNITURE	
Total production, bd. ft....	1,069,000,000	Number of employees.....	13,207
Number of employees....	21,045	Value of products.....	\$49,493,593
Value of products.....	\$56,374,735	Number of establishments	104
Number of establishments	234	<b>PAPER AND PULP</b>	
		Number of employees..	15,000
		Value of products.....	\$ 97,000,000
		Number of establishments	57
		Capital invested.....	\$120,000,000*
PLANING MILL PRODUCTS			
Number of employees.....	6,677		
Value of products.....	\$32,931,415		
Number of establishments	130		

## WOODEN BOXES

Number of employees.....	2,464	* Practically ½ the total investment in all Wisconsin's wood using industries.
Value of products.....	\$8,040,679	
Number of establishments..	55	

In industrial importance, Wisconsin ranks tenth among the states of the Union. We once ranked ninth, but some other states have grown more rapidly than Wisconsin's political policy would permit. That you can more easily visualize Wisconsin's most important industries in the order of their magnitude and at the same time comprehend their close relationship with forest crops, I have prepared the following table:

## TWENTY LEADING INDUSTRIES IN WISCONSIN

Rank	Name of Industry	Value of Products:
		1923
1st**	Butter, Cheese and Condensed Milk.....	\$217,142,916
2nd	Motor Vehicles (except motorcycles).....	119,190,907
3rd	Foundry and Machine Shop Products.....	115,090,658
4th*	Paper and Wood Pulp.....	97,923,538
5th	Slaughtering and Meat Packing.....	66,439,233
6th	Knit Goods and Textiles.....	65,015,720
7th	Boots and shoes (other than rubber) .....	57,000,651
8th*	Lumber and Timber Products.....	53,485,523
9th*	Furniture and Refrigerators.....	49,493,593
10th	Leather .....	46,823,815

11th*	Motor Vehicle Bodies and Parts.....	44,306,845
12th	Electric Machinery.....	33,923,159
13th**	Railroad Repair Shops.....	33,755,102
14th	Engines and Water Wheels.....	32,286,810
15th*	Planing Mill Products.....	31,635,629
16th	Rubber Tires and Tubes.....	28,802,111
17th	Flour Mill and Grist Mill Products.....	24,408,460
18th	Canning and Preserving (fruits and vegetables)	24,026,127
19th	Bread and Bakery Products.....	22,760,796
20th**	Agricultural Implements.....	19,701,003

\* Primary wood using industries. \*\* Secondary wood using industries.

Thus you see that many industries that have contributed toward making Wisconsin the wonderful state that it is, are largely dependent upon the lumber industry. A large portion of Wisconsin's annual consumption of about one billion board feet of lumber is used directly by manufacturers of other than primary wood products.

That we should conserve and replenish this entirely necessary stock of raw material close at hand is manifest. Already some of our industries are suffering from increasing remoteness of their wood supply. This is particularly true in the paper, pulp and furniture lines. Further embarrassment from that source is certain to result disastrously to many concerns. The following will show the present standing timber situation in Wisconsin and neighboring states:

#### ORIGINAL AND PRESENT FOREST AREA

Minnesota	had 38,400,000 acres, now has 20,900,000 acres
Michigan	had 35,200,000 acres, now has 18,400,000 acres
Wisconsin	had 30,080,000 acres, now has 17,800,000 acres
Illinois	had 16,000,000 acres, now has 3,148,000 acres
Iowa	had 5,120,000 acres, now has 2,314,000 acres

#### BUT!

Minnesota	has planted 181,642 acres of forest
Michigan	has planted 45,323 acres of forest
Wisconsin	has planted 5,500 acres of forest
Illinois	has planted 40,431 acres of forest
Iowa	has planted 220,000 acres of forest

As recently as twenty-five years ago the average freight cost on lumber at the point of consumption was \$2.00 per thousand. Now the average distance of freight haul is 1,000 miles at a cost of \$10.00 per thousand. This increased transportation cost due to increased

haul reflects itself directly in the pocketbooks of everyone, be he farmer, manufacturer, merchant, home owner or what not so long as he is in the classification of desirable citizen. The average increase in cost of lumber since 1913 is 80 per cent, which means that a home-builder's lumber bill of \$2,000 then will be \$3,600 today.

Less than one hundred years ago Wisconsin, in swaddling clothes, so to speak, started on her way to industrial development. Providence never showered endowments in greater measure than in Wisconsin. Every resource necessary to orderly development of both agricultural and industry is here. We have the soil, the power streams and necessary reservoirs, the climate and above all, the people, to move full steam ahead. We have our impediments, of course, but there are signs that even these, great and powerful but fictitious, are fading out.

We are coming gradually to realize the necessity and value of co-operating one with another. The impelling force behind that realization is our interdependence; that each has a selfish interest in the success of the other. So this group, representative of nearly every worth-while activity in Wisconsin, is gathered together to foster and further a movement that seeks to make amends for our short-comings of yesteryear. As a representative of diversified industry in Wisconsin, I feel certain that I voice the sentiment of all our members when I pledge to this undertaking the whole-hearted assistance and encouragement of the Wisconsin Manufacturers' Association.

## TO THE RETAIL LUMBERMAN

By BEN V. SPRINGER

The retail lumberman is a vital factor in the cycle of lumber production, distribution and consumption. He provided 98% of all the wood that was used on the farms, in fact, 40% of all the wood produced is used on farms. He provided 80% of wood dwellings in the cities, and he provided wood for other forms of construction. Is he vitally interested, I ask you, in the perpetuation of forests? In a commercial forestry program? He certainly would not deny his heritage and I maintain that his interest is especially along the line of continuing to serve the community in which he has grown and developed.

How can he do so but by maintaining the source of his raw material as close to the distributing point as possible? Our greatest problem today is getting raw material from long distances, paying high freight rates, paying out a lot of money for freight and making the consumer carry the burden. As soon as the price of lumber fluctuates, goes up, the retail lumberman is the first one attacked, and, after all, he is not at fault, because he is merely a merchant, buying and selling, so he is interested in these production problems, because the production problem reflects his own problem in his contact with the consumer.

As I see it, commercial reforestation will only be possible and successful if we complete our cycle. This viewpoint has been brought out in a general way, but specifically, as regards the retail lumberman, wise use of the forest material is the only way we can make replacement possible. Economically and commercially, a reforestation program may be made a success only if we continue to appreciate the gospel of wise use of material and your retail lumberman has become a real factor in this cycle. He has had to about-face, to understand his problems with a broader view, to go back to the production end, to study and learn lumber, so that he can carry these problems in an intelligent way to the consumer. Today it is necessary for him to teach the public how to make one board do the work of two, how to help in this conservation program and this reforestation program. He is meeting the issue by championing standardization of species, kind and grade, he is getting the utmost in wood utilization, all with a view to helping this very problem of commercial reforestation.

He is building a broader program of merchandising, he is not selling lumber as lumber, hit or miss, take what you please, but actually working out in a technical manner the uses of his material. He is selling not only the lumber, but the broader idea of the uses of lumber, the functions of lumber. He is the fountain head of home building, teaching his consumer public that the lumber yard is the place to get information on the intelligent use of lumber in the home; teaching them to build livable homes with the least waste of material; asking them to build beautiful homes, not only beautiful, but structurally correct. The retail lumberman is the one who is taking the initiative in modernizing the old home. He is talking to the farmer, telling him that by means of proper lumber structures on his farm he can get a greater yield out of his farm products.

I am speaking for hundreds of retail lumbermen in the State of Wisconsin; 92% of them are members of the Wisconsin Association. They are back of a program of this kind, because they are an enlightened working group, alive to the interests of this State. They are back of this program, because they believe that they owe their existence to the lumber industry and acknowledge the responsibility for help in its perpetuation.

## TO EMPLOYEES

By R. G. KNUTSON

It is a matter of common knowledge that in the last twenty-five years the metal industries in Wisconsin have grown more rapidly than the wood-working industries. In fact, there has been a tendency to regard the woodworking industries as "dying out", or at least on the decline, but the census figures show more employes and a larger payroll in the woodworking industries today than in 1900. Probably the reason for the popular misconception is that individual cities have suffered from the closing down of saw mills and planing mills and this fact is more dramatic than the fact that the mills that continue to operate may be increasing their operations. Moreover, there are other woodworking industries in Wisconsin besides saw mills and planing mills. I refer to the furniture factories, toy factories, refrigerator factories and casket factories. There is another industry that may properly be classified with the wood industries insofar as its dependence upon timber is concerned. This industry has been and still is on the up-grade. It gives employment to three times as many men today as it did in 1900.

While we may find comfort in the fact that our woodworking industries have at least held their own during the past quarter of a century and that the paper and pulp industry is on the up-grade, we must not forget that Wisconsin reached its maximum saw mill output long before the turn of the century. In 1900 only half as many men were employed in saw mills as in 1890 and that instead of obtaining the wood from Wisconsin forests both the woodworking industries and the paper and pulp mills have been compelled more and more to seek sources of supply outside of Wisconsin. When individual mills shut down forever because of the disappearance of a nearby source of supply it spells suffering for many workmen and

their families, since oftentimes there is no opportunity or very little opportunity to find other work in that locality.

Not only are employes in the woodworking industries and paper and pulp mills vitally interested in forests, but also the employes engaged in logging and lumbering itself. I refer to those who are usually spoken of as lumberjacks. The number of employes engaged in logging and lumbering has declined steadily in the last forty years, although a casual examination of the census figures might indicate otherwise. The census figures for 1900 show that only 5,954 employes were engaged as lumbermen, raftsmen and woodchoppers as compared with 27,356 in 1920. The explanation is that the 1920 census was taken on January 1st, whereas previous censuses had been taken on June 1st. The highly seasonal character of the industry would naturally result in many more employes on January 1 than on June 1.

In these days we hear much about the importance of stabilizing employment, so that we are somewhat inclined to look upon seasonal employment as an unmixed evil. By and large, it is; however, the peak of employment in logging and lumbering comes during the winter months when other outdoor employment, in fact, employment in general, is at its ebb. Therefore logging and lumbering furnishes jobs to many men who would otherwise go through the winter months without work. Indeed, it is well known that farmers living on cut-over land go into the woods during the winter months to obtain a supply of cash to carry on for the rest of the year. Moreover, many workers in the wheat fields secure employment in the woods at the end of the harvest season. Logging and lumbering has become much less seasonal since the use of modern machinery permits operation to be carried on during the summer months, although the number employed during the peak month of the year is still twice as great as the number employed during the smallest month.

Another characteristic feature of logging and lumbering, insofar as the employe is concerned, is its highly hazardous nature. The statistics of the Industrial Commission show that from fifteen to twenty men are killed each year. I am well aware of the splendid work that has been done by lumber companies in preventing accidents, but just as eternal vigilance is the price of liberty, is eternal vigilance the price of safety. The high labor turnover, the seasonality of the work and the physical conditions surrounding the em-

ployment require extraordinary effort to be put forth to reduce accidents.

So far as living conditions in the woods are concerned, I can testify from personal experience to the wonderful improvement that has taken place. The electric lights, radio, telephone and shower baths that I have observed in some camps are a great contrast to the conditions under which I worked as a lumberjack fifteen years ago.

In closing I wish to assure you that the Industrial Commission is interested in the forestry problem from the standpoint of the worker and stands ready to cooperate in any way possible.

## TO THE STATE PRESS

By C. E. BROUGHTON

Theodore Roosevelt said "that a country without trees would be almost as helpless as a people without children". A more truthful statement was never made.

During my newspaper career of forty years, I can recall how the forests have disappeared in our midst. By the average citizen, this was taken as the onward march of civilization—that the forests were being replaced by farming communities and cities with industries which would be more profitable. They have forgotten that we must rely upon the forests equally as much as we do upon the farm, if stability is to be an asset and progress is to be made.

Frequently we hear it said that the lumbermen of the early days devastated these forests, and I can recall abuses within my time. This, however, should make us stronger in our faith to undo that which was a misdeed. When the fire fiend wipes out a city, the people do not lose heart. They assume the task of rebuilding with all the forces at their command. What holds good in a city holds good in the forest regions of Wisconsin. We must build anew. Burnt slashings must give way to junior forests. If we are to make Wisconsin a state of diversified resources, we must build stability back into the interior. We must lift the tax burdens from the backs of those who are trying to farm on sections that are useless save for the raising of timber. We must encourage the upbuilding of the forests by the readjustment of our taxation laws.

In many of our counties which were once productive, delinquent taxes last year far exceeded those of the previous twenty years. This

ought to be a lesson. You can't have one-half of the state prosperous and the other half bankrupt. There must be a readjustment, to the end that each section of the state will be productive. Many an early settler came into a northern county, made a little clearing and built a shack, only to find that the soil was unproductive, and then migrated to another section. These pioneers were just as well versed in the rudiments of farming as the men of today. They failed, not because of their unwillingness to work, but because the soil was not fit for farm purposes.

We have a great future in Wisconsin, attracting, as it does, tourists from other states, but we cannot rely upon this to bring prosperity to those sections which cannot produce enough from the soil to pay the taxes. If we reforest this vast acreage, it will take a quarter of a century or more to bring it back into its own. During that period we ought to lend a helping hand, and if we encourage, through this conference, or any other gathering of men and women, a keener conception of what reforesting means, we will have rendered a distinct service to the state. Thousands of our citizens have been forced to surrender property because of the burdens of taxation and the failure to make ends meet. Give these same individuals, or the generation that comes after, half a chance, and they will make Wisconsin one of the greatest timber-bearing states in the Union. In some states you can't grow forests, but where there is a fertility such as we have in Wisconsin, we ought to grasp the opportunity. We ought to work hand in hand with the state, increasing our nursery at Trout Lake as fast as opportunity will permit, and adding others.

We want the tourists of the country to come here in the summertime and enjoy the recreation that can be found in the thousands of beauty spots that abound here. But more than this, we desire to build up a commonwealth—north, south, east and west—that will render our people self-sustaining, and guarantee to them better than a living wage. Let us go into these remote sections and help the man who cannot help himself. When you encourage the growing of a forest you are lending a hand in the interest of progress. We have been very shortsighted from the day this state was admitted into the Union. We have looked upon the destruction of the forests as a means of building up civilization, when in fact we have been tearing it down. We have cut all the available timber from the farms, until now the crying need in the rural section is for trees and more



trees! We have been living for the present and thinking little of the future.

Perhaps we can learn our best lesson on progress by reviewing the activities of the farmer. He sows in the spring and reaps in the fall, but he must return the seed to the soil the succeeding year if he would have another crop. And so we must think in terms of seeding and planting if we are to have a timber state. If this had been done twenty-five years ago, there would be no tax delinquent lands in northern Wisconsin. The hum of the sawmill would be music again, and if we had rotated, much the same as we do with our crops on the farm, there would be no shortage of timber at any time.

With these forests disappearing, unchecked water has forced its way into swollen streams at flood-times, and human lives have been sacrificed. I have been talking on the commercial side of this question, but there is a deeper and more convincing argument when we talk in terms of the toll of lives. We can replace forests in time; we can bring back stability to a certain area; but when a human life is lost there is nothing in dollars and cents that will compensate, and so, in the broader sense, we owe it to humanity to bring back the forests—the breathing spots of nature. Then, I think, we will again enjoy a united commonwealth of prosperity. If we do this, we will build a greater Wisconsin. What a gigantic task for the newspapermen of this state, but what a rich heritage for them to pass on to posterity.

## CHAPTER IV

# FORESTRY BY PRIVATE OWNERS

## DETERMINING FACTORS

*By F. K. BISSELL*

To what extent is the actual growing of timber practicable from a commercial standpoint? The individual, or company, which invests capital in plantations or young tree growth with the purpose of developing salable crop, needs to know many things. Much of the requisite information must consist of very rough estimates. The investor should know how many years will elapse before salable values will be grown upon the peculiar type of land which he possesses. A study of the ages of trees cut from this land will be very helpful but not conclusive. From 50 to 200 years may be required to produce saw-log timber. If there is a good stand of young growth, this time element will be appreciably reduced. Under proper but not too costly supervision, a greater volume of wood can be grown in less time than was required by the original forest. It is nevertheless certain that very long periods are involved.

The investor is entitled to a fairly approximate idea covering the estimated gross income from the project; the rate of growth of the different species on the peculiar soil of the land which he may use, and how many units of product in each of these species will be available at different periods. He must now make a guess at the market value of these units of product at the time they will be marketed many years hence. In view of our large Western forests, and the future possibilities of tropical hardwoods, he may not feel justified in estimating future values at very large increases over present values. If he can so handle his present timber as to secure cuttings every 15, 20, or 30 years, he will feel much safer in estimating his probable income.

The investor needs to know what his various capital and administrative costs and carrying charges will be, up to the time that timber values will give a cash return. Where long-time periods of from 20 to 100 years are involved, with little or no cash return during the period, annual costs become very important. The in-

vestor needs to know what his annual taxes will be; he needs assurance that they may not be changed in such a way as to confiscate the annual increase in value; and he needs to know what his administrative and fire protection costs will amount to. If the inducements of forestry are not attractive to private capital, the state must become the great forest owner. Wood is an indispensable material. Our industries demand the forests as sources of material. The economic position is now shaping itself so that private forestry will be remunerative on much of our lands. Why leave our remaining forest area to idleness when they are capable of producing an abundance of needed material. Each and every one of us is under a high responsibility for this negligence. Laws are needed which will encourage lumbermen and users of lumber to invest money in re-forestation projects.

Contrary to popular opinion, the loss of merchantable timber through fire is not great in the ordinary year. Machinery for the prevention and suppression of fire is usually able to successfully cope with fire in green timber, but the fire in cut-over or burnt-over areas, being the areas on which we must depend for future timber supply, is rapid and difficult to control. It is this class of lands which make up the great acreage annually reported as visited by forest fire, and it is the risk of having young, growing timber on such areas destroyed that constitutes one of the greatest drawbacks to present day forest practice by private owners.

Each year in the State of Wisconsin the timber on approximately 90,000 acres is removed to supply the mills, and if fires are thereafter kept out, a new forest replaces the one removed. Most fires are the direct result of carelessness, which must be controlled if adequate future timber supply is to be assured. What excuse can be offered for the careless smoker, the one who leaves his camp fire burning, the person who burns brush in the face of Weather Bureau warnings and bad weather conditions, or the one who sees a small fire and has not time to put it out?

Public co-operation must play a large part in the solution of our forest problems. Without question we will advance toward the proper use of our forest areas in proportion as public sentiment and economic conditions permit. Already we are given the assurance of permanent timber supplies to the extent that our Federal government, and some states, are the proprietors of areas devoted to forest growing. The policy of public ownership of forests is fairly

well established, and we may reasonably expect some expansion of such ownership, particularly on the part of our States. This, however, is not sufficient. It will be necessary to keep *all* of our true forest lands producing if we are to continue supplying our own needs. Happily our topography is such that we shall always have forests, or at least forest land, but whether these forests shall be healthy and vigorous, all that they may and ought to be, or a wilderness of brush, stumps and burnt desolation, depends upon our care of them.

Whenever the state advances in methods which give increased confidence in fire protection, additional potential acres are added. As timber tax reform, along the lines of the Wisconsin Forest Crop Law, becomes effective, many more acres become subject to commercial forestry. That is, commercial forestry is an extremely sensitive business plant and can develop only to the extent to which the proper environment is created. It is not a plant which can thrive anywhere, at any time. It will be found, that at best, there will be land which it may not be wise for either private or public initiative to endeavor to reclaim by forest growth. Nature is not niggardly, but she has her laws. You may use the product of her growth with wisdom and come back again and again to enjoy her renewal of it. She gives abundantly, but she does not give inexhaustibly. We are entitled to the use of the fruit, or the interest she bears, but if we dig into the principal, we do so at our own peril. You cannot destroy an asset and still have it.

## COMMERCIAL PRACTICABILITY

By W. B. GREELEY

W. B. Greeley, in his introduction to "Timber Growing and Logging Practice in the Lake States", says:

"In the last 50 years American wood-using industries of many kinds have become accustomed to holding timber reserves behind their plants. They pay carrying charges on these reserve supplies—often for 20 or 30 years—as a matter of course in order to protect their plant investments and hold their trade. It is but a slight modification of the same principle to carry a reserve, not in the form of costly old-growth stumpage, but of growing forests sufficient in extent to mature from year to year the volume of wood required for manufacture.

"There are decided financial possibilities in this new form of timber reserve. A tract of virgin timber seldom improves in either quality or volume while it is being carried. It may deteriorate in one or both. Its value ordinarily becomes greater only as the stumpage prices of the region advance. But a tract of growing forest, if well protected, is attaining higher quality and greater volume every year. And it has the same opportunity as a virgin stand to share in a general enhancement of timber values. And the cost of carrying it, figured per thousand feet or per cord coming to the mill, may be less than the cost of an old-growth reserve when it reaches the manufacturing plant.

"It is not practicable to draw a hard-and-fast line between the first steps that will maintain some degree of productiveness on forest land and the more intensive measures that will bring the quantity and quality of wood produced more nearly up to ideal results. Zon has not attempted, therefore, to deal with two general types of forest practice as separate and distinct. He has rather presented a common-sense resume of various steps in timber growing in a form that will be most helpful to the man in the woods. His bulletin has been written primarily for the landowner and the lumberman, to whom timber growing is a concrete business and logging problem.

"The opportunity for a profitable employment of capital and business talent in the growing of timber merits the same consideration and the same expert study as industrial opportunities in the manufacture of timber. This applies with special force to commercial institutions which have made large capital investments in manufacturing plants and distributing organizations, dependent for their maintenance upon a future supply of forest-grown materials. But it applies no less to owners of land, in large tracts or farm wood lots, the earning capacity of which lies in the growing of trees and which, without tree growth, will become either a doubtful asset or an outright liability.

"The Forest Service earnestly asks the forest-land owners of the Lake States to determine for themselves, with the same care with which they would approach any other business problem, whether timber growing offers a commercial opportunity which they should grasp.

"The Forest Service has tremendous faith in the commercial promise of timber growing to American landowners. The law of supply and demand is working steadily to create timber values in

the Lake States which will pay fair returns on forestry as a business. The economic history of other countries which have passed through a cycle of virgin forest depletion like our own, points to the same conclusion. The time is approaching when forestry, and forestry alone, will supply the enormous quantities of wood demanded by American markets. The fundamental laws of business must in the nature of things so operate as to enable the markets for forest products to be supplied at a profit to the grower of timber. The returns already secured from forestry at points in the eastern United States show that this relationship between the value of timber and the cost of producing it is coming about."

## THE STATE'S RESPONSIBILITY

*By* L. B. NAGLER

The forest crop law marks a distinct departure in our methods of taxation. In effect, it provides that the state shall co-operate with the owner of forest land and share with him the burden of the carrying charges over the long period of years that must elapse before the crop matures and yields returns.

The growing of forests is such a slow process that only an altruist will undertake it. The planter of trees cannot expect, with any degree of confidence, that the crop of timber will be harvested during his lifetime. This is why many people believe that forestation should be undertaken only by the state. There are others who are just as bitterly opposed to such a policy as they are to any other problem of state socialism. Therefore, it would seem to be a fair compromise to adopt a policy, such as is contemplated by the forest crop law, which makes the state a co-partner of the private landowner, to share with him the responsibility as well as the results.

The rehabilitation of our denuded forest lands cannot be left to the slow and inefficient processes of Nature. To do this would be as unwise as to leave our fields uncultivated and unplanted. Nature is truly wonderful, but she performs greater wonders with the aid of human hands guided by knowledge and experience. If they are left to Nature's care alone these lands may reproduce another crop of timber in the course of a thousand years, but if they are artificially planted, and properly protected, they can be made to produce another crop within the span of a single lifetime.



(Above) TROUT LAKE  
NURSERY

Seedlings and transplants sold at cost for planting in Wisconsin. Area  $7\frac{1}{2}$  acres; annual output more than two million trees.

(At right) FOREST AFTER  
SELECTIVE CUTTING

Northern hardwood forest from which 50 per cent of the sawtimber has been removed. It can be logged in this manner every 15 or 20 years.





WHITE PINE PLANTATION, ADAMS COUNTY

Planted 6 feet x 6 feet on Plainfield sand, wild seedlings 18 inches to 30 inches high in 1893-94. Present average height 40 feet; diameter breast high 8 inches to 12 inches. Photos by F. G. Wilson.





To encourage tree planting Wisconsin operates a small nursery for coniferous trees at Trout Lake, in Vilas county, with a present output of about one million trees annually. The program of the conservation commission contemplates that its capacity be increased to ten million by 1930. It should be expanded to meet the requirements of the entire state, and it is to be hoped that within a few years these requirements will call for thirty million or forty million trees annually. Our program also calls for the establishment of a second nursery at the southern end of the evergreen belt, in the latitude of Juneau county. This is necessary because of the lateness of the season in the northern part of the state where the frost sometimes makes it impossible to remove the young trees before the planting season in the southern area has passed. The commission also contemplates the establishment of a nursery for deciduous trees.

The sale price of these trees presents another problem. The recommendations range from \$2 per thousand to a profitable enterprise at \$10 a thousand. The concensus of opinion among enthusiastic advocates of reforestation seems to be that the state should make a further concession to owners of denuded forest crop land to the extent of furnishing these young trees at cost or less, and, since the state is in fact a partner in the business, and since the public as a whole is benefited by it, there can be no valid objection to the proposal that the state should contribute the young trees for planting, either free or at a nominal price. New York has sold seedlings in large quantities at fifty cents a thousand and under this stimulus the citizens of that state planted more than twenty million trees in 1926.

Public opinion in Wisconsin favors an aggressive forestry program. This sentiment is reflected in the action of the legislature in passing the forest crop law and the law which authorizes the several counties to participate in the work of reforestation. This convention reflects the deep interest that land owners and the manufacturers of forest products are taking in the subject, and everything indicates that the time is ripe for launching a program for this magnificent enterprise on a grand scale. The success of municipal forests in European countries, particularly Switzerland, where some communities are untaxed because they derive sufficient revenue from the forests which they own and maintain, has inspired many cities and villages in eastern states to acquire land for this purpose.

If this awakened interest can be capitalized and translated into action so that the state, counties, municipalities and private citizens will adopt a common policy and attack the problem with enthusiasm and in a spirit of co-operation with one another, we may confidently expect that at the close of another decade we shall be able to point to our thriving young forests with the same pride of achievement that we experienced at the end of the first ten years of our highway program, the success of which far exceeded our fondest hopes and expectations.

The problem of reforestation which faces us now is comparable to the highway problem with which we were confronted twenty years ago. It is too vast and too important to be left to the whim or caprice of individual land owners. There must be a definite program to be followed uniformly and co-operatively, and the state must assume the responsibility for its success.

### THE FARM TIMBERLOT

By F. G. WILSON

One fourth of Wisconsin farm land is woodland, so the importance of the farm timberlot is evident. Unfortunately, due to grazing, these woodlots are not as productive as they should be. But even now, in addition to supplying the needs of the farm, they are producing some material for sale. I have seen oak veneer logs loaded on cars in Grant County, the extreme southwestern county of the state, for shipment to Rhinelander.

While the tendency has been to cut the best and leave the worst, some farmers are working to improve their woodlots. Last winter Frank Wood of Hancock removed one hundred stove length cords of scrub oak at a profit above cost of cutting and hauling, of \$1.25 per cord. This gave an income of \$125.00 from a twenty acre tract. At the same time, he was making an improvement cutting, favoring an excellent undergrowth of white pine. He can repeat this for another two years and then cut a carload of jack pine pulpwood for another three years, always improving his young stand of white pine.

It is much easier to interest farmers in planting pine seedlings on waste land than to improve their existing stands. Demonstration Forest Plantations have now been established in thirty-two

counties. The number of seedlings used for planting on private land has increased more than four times in the last three years. The purpose of this work is not only to teach farmers how to plant, but to establish plantations which will prove how practical the work is.

Several older plantations have been discovered which are very convincing. The oldest timber plantation in the state which I have been able to find was set out by Walter Ware near Hancock in 1876. At fifty years some trees were cut and sawed into barn timbers. They average seventy feet high and fourteen inches in diameter at breast height.

Most of these old plantations were established by planting wild seedlings. An interesting exception is the spruce plantation near Prescott which Louis Frank set out in 1893. Several years before he had sent to his relatives in Germany for Norway spruce and raised the seedlings in his garden. At thirty-four years of age, the tallest tree was sixty feet high and ten inches through. I have never seen in Wisconsin a spruce stand which ran over thirty-five cords to the acre, and I have not been able to find an old cruiser who has. Yet, at thirty-four years, this stand ran forty-three cords to the acre, counting only trees six inches and over in diameter. This is practically a cord and a quarter per acre per year, which at \$12 per cord, delivered at the railroad, means \$15.00 per acre per year. This without investment in farm machinery, buildings or annual labor costs.

It takes a long time to grow timber. That is the chief difference between farm crops and timber crops. Obviously a farmer cannot cut more grain or dig more potatoes in a year than he has grown. But we can and have for years cut more timber than we have grown. Consequently we must do some waiting while we are restoring our forest capital. Let us assume that this man had continued planting an acre to spruce each year on this unimproved forty. In another five years, he would have reached the stage where he would be entirely indifferent as to how long it takes a tree to grow. Each year thereafter he could cut and replant an acre forever. Instead of harvesting one year's growth from forty acres, he would cut forty years' growth from one acre. With his annual growth of a cord and a quarter per acre, his forty would grow fifty cords each year. If he cuts no more than he grows, this fifty cords at \$12.00 would bring \$600 annually as a winter crop when labor and teams are available.

We established a jack pine plantation in Juneau County in the spring of 1926. The following year, we added white and Norway pine. I noticed a fire had killed several hundred acres of jack pine ten to twenty feet high, but had been stopped near the edge of the plantation. On questioning the men, who had also helped plant the previous year, it developed that they had stopped the fire. The interesting point is that these men did not own the plantation, but had merely been hired to plant by the owner. And yet they felt that they had enough of a stake in the undertaking to save it. We will admit that the area which is being planted in Wisconsin is negligible, but the work is developing a forest mindedness which must become general before our forests will be safe from fire.

### PULPWOOD PRODUCTION

By J. E. ALEXANDER

After a careful reconnaissance survey in the fall of 1925 from 1,500 to 2,000 acres of Company land in the immediate vicinity of Port Edwards and Nekoosa, Wisconsin, (bordering the Wisconsin River) were found to be in a non-productive state and fit ideally for artificial planting. The soil in general was of a very light sandy nature especially adapted to the growth of Norway and Jack pine timber. Between two and three thousand acres of this same kind of land were found to be either partially or fully covered with Norway, White, and Jack pine second growth or young reproduction, crowded in some places and in others suffering from keen competition in growth with Scarlet and Pin Oak. Uncontrolled forest fires had left their damaging effects upon practically every acre examined, and this accounted in some measure for the unproductive condition of the land, supporting only the Scrub Oak as it is commonly termed.

Since an extensive artificial planting program seemed practical and feasible it was decided to start a small forest nursery in the spring of 1926. This was done and this nursery now has a yearly production of five hundred thousand coniferous trees. Several important reasons encouraged the establishment of this nursery. First, the difference in the beginning of the planting season between the state nursery location (the only practical place to buy trees for forest planting) and our location in Central Wisconsin, usually run-

ning from two to three weeks earlier in Central Wisconsin. Second, the convenience of being able to plant as soon as a crew is assembled. Third, all planting stock can be field planted a few hours after being raised from its nursery beds.

In the spring of 1926, after considerable difficulty in locating Jack pine seedlings for field planting purposes, we were able to obtain 100,000 three year old seedlings from the Cloquet Experiment Station, Cloquet, Minnesota. From these three year old seedlings 55,000 were field planted after careful sorting and grading. Twelve thousand two year old Jack pine seedlings were also obtained from the Forest Service at East Tawas, Michigan, during the same spring and they were planted along side of the three year old seedlings. During the spring of 1927, 33,000 Jack and Norway pine seedlings were field planted, making a total of approximately 100,000 trees the first two years of our forestry program.

In the fall of 1927 two year field planting stock became available from our own nursery and we planted in the field, approximately 240,000 Jack pine seedlings making our total plantings up to date 340,000 trees. During this year our nursery will furnish 500,000 trees for field planting and plans have been made for setting out that many trees this year. All Jack pine seedlings have been spaced in the field from five to six feet apart. We have also confined ourselves to furrow planting wherever practical. Plowing is done in the early fall and spring.

A 70 foot fire tower has been established for fire detective purposes and has been in operation during the past year. Another fire tower is being built on top of the Nekoosa Chip-bin and this look-out tower will be at least 85 feet from the ground. It will be in operation before the spring forest fire season starts. A Dodge fire truck located at Port Edwards is fully equipped with forest fire fighting tools and equipment such as Evinrude fire pumps, Smith Indian fire pumps, shovels, pails and axes. A full emergency crew has been organized for fighting fires and accompanies the truck on all forest fire runs. Tools and equipment have been ordered for a second truck located at Nekoosa and it will be fully equipped by April 15th. A Ford service truck located on the east side of the Wisconsin River directly east of Port Edwards, can be called into service for forest fire fighting at any time and its equipment is identical to that for the Dodge truck at Port Edwards. Our mill whistles both at Port Edwards and Nekoosa sound a distinct forest

fire alarm when a forest fire is reported. All Company fire towers will be available for use to the Wisconsin Conservation Commission.

Plans are being made this year to make a few release cuttings especially where the Scarlet and Pin Oak seem to be crowding and injuring the White, Norway and Jack Pine natural reproduction stands. During the summer a few acres of swamp land may also be given some superficial drainage for experimental purposes. Splendid co-operation and assistance has been given to us by the Wisconsin Conservation Commission, Lake States Forest Experiment Station, National Forest Service, and Michigan State Forest Service. We shall be pleased at all times to pass along our experience to those companies and individuals who are now undertaking reforestation projects. We wish them to feel at liberty to call on us at any time, for such information as we now possess, that might prove helpful to them in working out their reforestation problems.

## SAWTIMBER PRODUCTION

*By* W. A. HOLT

The time element is the big stumbling block in the pathway of Commercial Forestry. With Nature one thousand years is as one day and processes which require hundreds or thousands of years are entirely feasible. With man, whose days are as the flower of the field, time is an important element. Commercial Forestry has not been extensively practiced because the length of time required to grow timber from seed is so long that taxes, interest, fire protection and risk will make the timber when grown cost more than its value, unless its value at that time is much greater than it is at present. By reducing taxes, interest and other costs and by an increase in stumpage values, it is hoped to make Commercial Forestry possible. In the meantime we are cutting all of our timber, the best of which has taken several hundred years to grow, and realizing very little more, if as much, as it has cost us to manufacture it. Is there any possible way of improving this deplorable condition?

One way is by selective cutting of the forests. In the Lake States the small hardwood trees are manufactured into lumber at a loss and the good trees have to pay for the poor ones. Just where the line comes depends on the cost of logging and the quality of the

timber but generally speaking a hardwood log under fourteen inches does not pay and yet it has taken probably 100 years to grow the tree to that size. Such a tree has a start of 100 years over a seedling and is growing every year and increasing in scale more rapidly each year as its diameter increases. In a comparatively short time such a tree will pass the line from the unprofitable to the profitable class. In the open the seedling grows short and scrubby with branches almost down to the ground, but it grows fast in diameter. In the thick forest it grows tall with limbs higher up, reaching out for sunlight, so that even a small tree may be very tall. Now, thin out this forest and let in the light and the trees will increase much more rapidly in diameter and consequently in value than they did before the thinning process. In cutting the larger trees only, the operator increases the average value of his product with very little increase in cost of manufacturing and has left a stand of timber that is growing faster than it ever did before, and the growth is largely clear, free from knots. The small logs being more expensive to log, freight to mill and manufacture into lumber and the product being mostly No. 3 or cull lumber, it is evident that the cost will be less and the realization price will be more if the timber is cut to diameter limits that will produce a profitable return than if it is cut clean. The other side of the picture is possible additional cost of skidding, logging railroads and sleigh roads, due to smaller stands per acre, and fire and wind risk. In many timber tracts this additional expense will be less than the gain through the logging of larger logs.

There is nothing new about selective logging. The Lake States were all logged in that way, the pine, and in many places the other floatable timber, having been removed, and the heavier, unfloatable timber left. In many places where the logs could be gotten to the mills without floating, Birch, Maple and Elm was cut and only the best trees taken and in these places there is now a good stand of merchantable timber. In Indiana, Ohio and part of New York, large quantities of hardwood logs, millions of feet annually, are being cut from "woodlots" and other small tracts and there seems to be no end in sight. If the clean cutting method had been followed these states would have been out of the lumber producing business years ago. Selective cutting will no doubt shorten the life of many of the large mills, but the remaining timber will support smaller and fewer mills for a long time, and will net the timber owners more money in the end.

Hemlock is a little different proposition because there is not the increase in quality that there is in Hardwood, but thinning out of the forests increases the growth and the very old timber is decreasing in quantity because of decay and death. By cutting the mature timber and leaving the young timber the yield will be eventually greatly increased.

One of the most serious inroads on new growth of timber is made by the use of hardwood saplings as car stakes for equipping flat cars for the transportation of forest products. It has been estimated that three million trees per year are cut to make car stakes in the Lake States annually. The railroads require either a maple or yellow birch stake that will square up 4x5 inches, and twelve stakes to each car, and these are temporary stakes, only a small percentage of which are used more than once. It is probable that there is a greater destruction of young trees from this cause than there is from fire and it is unnecessary, as cars can be equipped with permanent stakes and all the young trees left to grow. There is no use in cutting timber by the selective method, and then going over the land and cutting the trees that are five or six inches on the stump for car stakes.

There is one other very interesting possibility in the selective cutting of Hardwood. Up to this time the lumber containing knots has either been cut to shorter lengths and narrower widths and the knotty parts thrown away, or else the entire piece has been thrown into a lower grade and most of it into the lowest grade. There is now a movement on foot to introduce Northern Maple and Birch, stained and finished in beautiful colors. This should create a demand for sound knotted lumber which is even more beautiful than the clear wood, when finished in colors. This would make more valuable the smaller logs, from which the greater percentage of knotty lumber comes, and make it commercially possible to manufacture timber which is not as old as is now necessary to get profitable grades. We have never fully realized the beauty of our Northern Hardwoods and when we do, it will be possible to realize a much higher price for them and consequently make Commercial Forestry more practical.

Let us not wait until the forests are gone before putting into effect some method which will enable those now living to get some benefit from our efforts. If time is an essential element, let us get started as soon as possible and push it as fast as we can.



## OPERATING RESULT

By GEORGE BANZHAF

It is now four years since the first selective cutting was made on the Holt property and the following deductions may be made with truth from a study of those earliest cuttings:

The cost of logging has been not at all excessive. We submit the cost figures for the period November 1, 1926, to March 31, 1927:

	<i>Per M</i>		<i>Per M</i>
Labor Saw Boss .....	\$.24	Teams Loading Sleighs .....	\$.09
Labor Cutting Logs .....	1.88	Teams Hauling Sleighs .....	.56
Labor Skidding .....	1.79	Teams Decking .....	.09
Teams Skidding .....	.26	Camp Expenses .....	.72
Camp Expenses .....	.99	Depreciation .....	.16
Depreciation .....	.22		
	<hr/>	Logs at Landing .....	\$10.02
Logs in Woods .....	\$ 5.38		
		Labor Loading Cars .....	.78
Labor Building Roads .....	.46	Camp Expenses .....	.20
Labor Repairing Roads .....	.95	Depreciation .....	.05
Labor Loading Sleighs .....	.54		
Labor Hauling Sleighs .....	.55	Total .....	\$11.05
Labor Decking .....	.29		
Labor Landing .....	.04	Depletion of Timber .....	4.53
Teams Building Roads .....	.06		
Teams Repairing Roads .....	.13	Logs at Main Line .....	\$15.58

The windfall has been not at all serious. With proper attention to a well filled forest crown cover, the volume of timber removed from a forest may be raised as high as 75% of the total volume without great hazard of loss from windfall or wind breakage. It was felt that when the stand was opened up many hemlock trees would die as a result of sun scald or other vague causes, but we have not found it at all true under the selective logging practice that we have instituted. We note that the forest floor normally stays moist, if the crown cover is kept sufficiently dense.

The slash which was cut down but which was not piled or burned has been thoroughly flattened out by the snows and is rapidly disappearing. We have simply lopped the slash and scattered it at a cost of about 30c or 35c per thousand feet of timber logged. No burning of slash has been done except immediately adjacent to main trunk highways.

We have been concerned with the effects of rot creeping into

the very susceptible hemlock and hardwood trees as a result of breaking off of limbs and scuffing off of bark due to falling timber, but we have as yet discovered no basis for anxiety insofar as this operation is concerned. It was also argued that insects would breed in the slash and attack the standing trees. It is our opinion that the insects that undoubtedly do breed in the slash of the hemlocks and hardwoods are not the type which will attack the living vigorous trees.

It is difficult to determine definitely at this time what the actual volume growth of the remaining timber is, but if the foliage development of the trees may be taken as an indication of the volume accretion, then we may be assured of a good growth. Upon the opening up of the crown cover of the forest and the release of the crown of the hardwood trees, these trees develop vigorous branches which help to fill up the holes left after cutting. We have found also that the young trees up to two or three inches in diameter come along excellently and are making a rapid growth.

## EFFICIENT LOGGING PRACTICE

By R. D. GARVER

Mr. Holt has pointed out at least three things to do in our first attempt to practice commercial forestry, namely—(1) cut our remaining virgin stands selectively, (2) refrain from ruthlessly wrecking the future forest by cutting the small trees for car stakes, and (3) develop a market for short lengths and knotty material. In his characteristic way of getting down to the essentials of any job he has chosen points which are actionable.

Consider point (1)—Studies at four typical hardwood-hemlock operations in the Lake States showed that: Cutting trees under 12 or 13 inches in diameter is unprofitable even though no stumpage is charged, first, because the lumber from them is not worth its cost of production, and, second, the value of the land either for timber growing or recreation is greatly reduced. This means that an operator cutting standard lumber makes money by leaving these small trees on the ground even though he has no thought of a second cut or does not own the land.

Production costs do not increase materially under selective logging until a cutting limit of 16 inches is reached. Many things

favor commercial forestry in the hardwood-hemlock type. It is ideally adapted to selective cutting, because it is made up of trees of all sizes and ages. Methods of logging now in use fit in with selective cutting. A stand need not be wrecked by selective cutting as evidenced by the areas so cut on Mr. Holt's holdings where there appeared to be very little damage to the trees left on the ground. On another area by actual count there were only 89 trees on an area of 20 acres which had been knocked down in felling and only three of these were over 12 inches in diameter.

I do not believe that the importance of his point (2), that is, skinning the ground of young growth for car stakes, is generally recognized. The destruction of young growth for this purpose is enormous. To supply the demand requires nearly all the small trees 5 to 9 inches in diameter left after selective cutting. In hauling a thousand cars of logs we used up close to 10,000 trees or enough to stock nicely about 40 acres of land.

Mr. Holt's third point, that of obtaining closer utilization by using short length and knotty lumber, is another place where action can be had. End matching is making it possible to use short lengths, and industrial concerns are waking up to the fact that in the purchase and use of short lengths lies a chance to save some money. For example, tank and cable reel manufacturers can use short-length lumber to advantage. Knotty finish has beauty, but it is not yet generally appreciated. There is at least one house in Madison finished in knotty material. Certain rooms in the magnificent Hotel Shelton, New York, are paneled and trimmed with knotty material. A fraternity house at Granville, Ohio, is finished in knotty trim. Many other examples could be cited, but these few give convincing proof that the use of knotty material is developing. Architects are the men who can best sell the idea, and it seems to me that the producers in the trade extension work would do well to select this as one of the points on which to concentrate.

## SECOND GROWTH POSSIBILITIES

*By G. HAROLD EARLE*

In the late eighties the founders of our company had on their hands a block of land from which the Pine had been cut. Their problem was to devise some commercial utilization of the hardwood

that remained. To this end special processes and machinery were invented for mill finishing hard Maple flooring from live sawn logs, coloring sap Maple to make what was known as "cherry" Maple, manufacturing Basswood mouldings and trim, steamed Elm ceiling, making charcoal from the waste, etc., and even the Hemlock was cut into lumber. So beginning in the early nineties the logging operations included the cutting of all species of timber down to smaller diameter limits than the usual practice. The land was considered to have value for agricultural purposes and burning of slash after cutting was deemed beneficial as part of the clearing process. Some small areas however escaped, and during the period between 1890 and 1920 some of these descriptions were logged over three times. Unfortunately the cutting records were not kept, but I have heard my father make the statement that more timber per acre was removed at the third cutting than either the first or second.

Since it has become evident that regardless of soil fertility most of the cutover hardwood lands will not soon be utilized for agricultural purposes, and since we now have reasonable assurance of protection from loss by fire, we have been giving some consideration to other commercial possibility of our cutover land. Even good stands of Poplar are found to have some value for excelsior wood. In other places where fires have not run, we find a thrifty second growth of Maple, Birch, Elm, Ash, Basswood and Hemlock, from 2 to 6 inches in diameter, and occasionally trees of commercial log size considered too small at the time of previous cutting.

We have the greater part of two townships surrounding a manufacturing plant with a fair percentage of young second growth on it and logging roads cut. In the course of ten or fifteen years when the virgin timber for the manufacture of lumber and hardwood flooring has all been cut, there ought to be some way of utilizing plant and organization to manufacture something of value profitably from the young timber now growing, provided there is relief from taxes now imposed upon such lands. We have progressed much further toward the solution in Wisconsin than we have in Michigan.

We started an experiment less than two years ago, with a solidly blocked township in Schoolcraft County, known as Blaney, or more recently, as Blaney Park. This is an isolated block on which logging operations were conducted from about 1902 until 1927. The little Village of Blaney, started as a model small town by the Wm. Mueller Company in 1902, is in the exact center of the township,

which is traversed by a Federal Highway and a State Highway which join just south of the village. All of the land in the township is under one ownership except a few farms, all situated in one corner of the township and along the Federal Highway.

Just back of the one street in Blaney Village stands about thirty acres of as nice virgin hardwood timber as is to be found anywhere. We left this timber because of its outstanding beauty and picturesque-ness, intending that it should be cut, if at all, the last thing before operations were wound up and the little town abandoned. Because this township has no side roads through it, is surrounded quite largely by swamp land, and there was another logging operation on one side only, the organization there was fairly successful in coping with the forest fire situation, with the result that possibly 10,000 acres of the 20,000 which have been cut, have never been burned over. The unburned area is reforesting itself very nicely and even some of the burned over area is restocking with native species.

About the time we were preparing to wind up the logging operations, pull up the railroad and move our equipment elsewhere, it seemed as though there was nothing left but to salvage what might be saved of the run-down little village, abandon the rest, and let the tax collector take most of the land. We had quite a little sentiment for this little village on a broad hilltop backed by Hemlock and Hardwoods and originally constructed as a model village with complete waterworks and electric lighting system, even though it was badly dilapidated. At the same time also, various club projects attracted our attention. It was suggested that perhaps Blaney could be utilized as a hunting camp or as a start toward a club development. But, a very serious draw-back seemed to be the lack of a lake. Then someone suggested that possibly the old dead Cedar and Tamarack swamp at the foot of the hill, through which meandered Bear Creek, could be made over into a lake. It was decided to have a general inventory of the whole property made. The firm of Banzhaf & Watson was engaged to make a general examination and maps of the entire area. The report disclosed an unusual unburned area, with a fairly well distributed stand of second growth hardwood and immature swamp timber. The report called attention to a native beaver colony on one of the streams, suggesting the possibility of a commercialized beaver farm. It also mentioned that approximately 130 deer wintered on the property in several excellent deer yards. It was suggested that an old farm might be

converted into a golf course. Aviators suggested that the broad cleared hilltop provided a natural landing field for aeroplanes.

It was decided to make the village a recreational center and convenient stopping place for tourists. Starting in the summer of 1926, a crew was put to work repairing and painting the buildings, constructing the dam, clearing ground for the lake, and constructing a golf course. The twenty-five buildings have been utilized and accommodations provided for 100 guests. A successful fox ranch has established a branch of Blaney. A 50-acre lake has been completed, and incidentally, a 500 acre marsh created above it by raising the stream level, which seems to delight the ducks. A fire tower has been constructed on an elevation in the center of the township. The golf course will be ready for play this summer. A service station has been established. Our dairy herd and equipment will be moved to Blaney this spring. Dairy products, eggs, chickens and fresh vegetables will be supplied.

So far most of the effort has been concentrated on the development of the recreational center. However, the resource which we are really depending upon to make a success of the entire enterprise and the thing we consider that we have invested our money in is the stand of second growth and immature timber of both high land and swamp land species. We intend to operate all of Blaney Park, which includes 22,000 acres, as a commercial forest reserve. When we cut fuelwood during the winter months we will, at the same time, be conducting experiments in selective cutting of the second growth, where stands appear to be too thick. We also plan on selective cutting in the overly dense stands of Spruce, to be found on about a thousand acres. While, for the time being, the recreational feature may seem to predominate, that is not the most important or ultimate development we have in mind. We figure that the ultimate return from our investment, if any, will come through timber growth. The whole thing is an experiment; we have not attempted to work out mathematically the rate of growth of timber, the average production per acre, the future value at the end of a given period of years, or anything of that sort, as yet.

After cutting off what merchantable timber we could use immediately, we had left 22,000 acres of land, a very little merchantable timber, and some buildings and improvements which had served their purpose and seemingly could serve no further use. With one-third of the land in the Upper Peninsula of Michigan tax delin-

quent, there seemed little hope of finding a buyer for our land, at any price. We might salvage a very little and abandon the rest. Without any management, protection and supervision, whatever potential value remained would likely be destroyed, making it questionable whether it would be advisable to continue to pay taxes. With some additional investment the property might be put to some small use and the timber growth protected at the same time and perhaps improved. If the experiment is a success, the difference between the additional investment recently made, plus carrying charges, and the ultimate realization will measure the degree of success. It looks to us like a very good gamble.

### FINANCIAL ASPECTS

*By* MERRILL COIT

Financing is fundamentally a credit operation—and credit is defined as the present use of a future value. The creation of large future values in merchantable timber is of course the economic basis of present-day forestry science. There are primarily two types of forest development possible. One, sustained yield through limiting the average annual cut from any given forest area, to the point where growth will supply a continuous production; the other, reforestation of completely cut-over lands by replanting. And there are two general angles to the financial aspect as well. That of the lumberman ready and eager, if possible, to make his business a permanent one—and the other the attitude of the commercial and investment banker seeking safe avenues for the placing of funds.

At the present time, at least, there seems little likelihood of banks or investment houses considering loans or the provision of funds for reforestation of completely cut-over areas. There are several primary reasons for this: First, such enterprises would completely lack income with which to pay carrying charges on borrowing funds or dividends on securities, for a period of at least 30 to 50 years. It is hardly conceivable that bankers or the public would be interested in making investments, where income is so long deferred. Second, the hazards, incident to growing a crop of timber from seedlings, are not as yet insurable. Fire hazard to mature timber is now controllable. The Western Forestry and Conservation Association, which protects practically all of the privately owned

timber on the Pacific Coast, has developed the science and system of fire protection in the Western states to the point where the loss of merchantable timber is less than  $\frac{1}{4}$  of 1% annually. And even in cases where full grown timber is fire-killed, its savable value is often large, whereas in the case of the killing of immature trees by fire, the loss is complete. Much the same comments as to immature timber apply to wind hazard and the dangers from insect pests.

It therefore seems probable that forest development of strictly cut-over lands through planting, will be limited to enterprises carried on by the United States Government or the states, or to a relatively small portion of the timbered area of large lumber manufacturing units. The financial aspect of that character of forest development may, therefore, be classified as "impossible" for the present, at least, except to venturesome private capital or Government enterprise.

Are the financial aspects of sustained yield more encouraging? We have had, as a close associate of our office for several years past, Mr. William L. Hall, president of Hall, Kellogg & Company, Forest Engineers, and now handling the reforestation plans for an important group of Southern operators, including The International Paper Company and Dierks Lumber & Coal Company. We have further had quite close touch with many lumber companies earnestly studying the problem of reforestation and in no case can we see encouragement or hope of any program looking to the perpetuation of lumber operations, except where State and County governments and all those interests which direct their actions, recognize the necessity of special taxation and assistance on fire protection.

Taxation without representation was recognized some years ago by our forbears as thoroughly unsound. Taxation without income, one of the problems of reforestation today, is similarly being recognized as destructive. Those who have realized this situation have been untiring in their efforts to secure relief and to have systems of forest taxation inaugurated such as are afforded the forests of practically every other progressive country but ours. Until recently the subject had never received proper consideration from the revenue-gathering authorities as a vital factor in land utilization and permanent taxable revenue. It is only now that the country as a whole has come to appreciate that the general land tax was inimical because it has taxed every year, the expectation value of the timber



crop—a tax which should be properly levied but once; namely when the timber is cut.

It is a most encouraging sign that recognition of this situation is steadily and rapidly growing. From all sides the importance of the forest to the entire community is being acknowledged. As Mr. Lewis Pierson, president of the Chamber of Commerce of the United States, stated at the last Natural Resources Conference in Chicago: "Forest wealth sustains many communities, stimulates all industry. Where virgin forests still are harvested, business is active; where they have disappeared it is often stagnant. They regulate the flow of streams, prevent soil erosion, and insure abundance of pure water. National welfare demands their perpetuation".

Far-sighted and clear thinking leaders in all fields of industry are interesting themselves to see that everything possible is being done to prevent further inroads on this great national resource. Wisconsin has been peculiarly fortunate in her far-sighted leaders in all important branches of her activities in the practical development of plans for encouraging the maintenance of her forests and forest enterprises. For those who are willing to place their funds at 4% interest, her present taxation program for lands set aside for the growing of timber, is good—but she has not gone far enough. While a real stride has been made in the right direction, all too few lumber operators will be found who can afford to attempt operating under the present provisions. And this is particularly true of the 10% severance tax since it makes it almost impossible to place lands carrying mature timber under the provisions of the present law, with the result that taxes are forcing a too rapid cutting of Wisconsin's remaining virgin stand, whereas its orderly cutting is of the greatest possible interest to the state at large. We believe that a 5% severance tax should be the goal of the state, particularly as Wisconsin lumbermen must meet the competition of Southern states where the rate of growth is far more rapid.

Such encouragement to the Wisconsin lumberman will save many from abandoning their logging railroads, equipment and saw-mills within the next 10, 15 or 20 year and will change Wisconsin's lumber industry from a period industry to a permanent industry. This is not theory—it is the sober conclusion expressed to us by many of your ablest Wisconsin lumbermen.

Adequate fire protection is the second essential to every aspect of forest development, including that of finance. The Lake states,

including Wisconsin, have made relatively little progress in fire prevention, as compared with the West Coast states. A more acute fire consciousness must be created. Many agencies, public and private, must co-operate in this. Adequate protective organizations equipped with proper facilities and manned, or at least directed by men who know their job, are also necessary. The Western Forestry and Conservation Association sets an excellent example of what might be accomplished.

Quoting R. B. Goodman:

"Such favorable factors are cumulative. The better organization of the lumber industry will mean less wasteful competition between species, better marketing and a vigorous policy of national advertising. The exemption of taxes on growing timber, private forestry undertaking to perpetuate a raw wood supply and efficiency in utilization of the forests, will all tend to public confidence and lower interest rates on timber loans."

Which is to say, that adequate finances for forest development will follow scientific taxation and fire protection.

## DEPLETION AND DEPRECIATION

By CARL M. STEVENS

A policy of Selective Cutting which first removes the more valuable stumpage, raises the depletion allowance for the particular stumpage removed, and to the extent that this disparity in value can be demonstrated. It is a question of fact which will vary with each property and each plan of operation. The Federal Income Tax regulations issued by the Commissioner of Internal Revenue comprehend just such adjustments. Mr. E. L. Lindsey, the present Chief of the Timber Valuation Section, has approved this exact principle on the basis of our preliminary analysis of the situation for certain properties in this region. Further, Lindsey has agreed to accept as a showing of fact such an analysis as is possible from existing studies, and necessary as a preliminary step to the determination of a change in cutting policy. This analysis must, of course, be adapted to the local situation.

The total lump sum depletion allowance which has been approved by the Commissioner will remain constant. However, permission should be secured to divide the stumpage account into two

parts; including in one account the stumpage over the diameter limit of cutting and in the second account the stumpage under the diameter limit. The average unit depletion rate of the two accounts must equal the 1913 unit value or cost as the case may be. The reallocation to the two separate accounts has been approved by the Timber Valuation Section on the basis of 1913 values. We believe this segregation more properly made on the basis of present values or the relation between values at the time the split is made. This must be subject to further negotiation. After a cutting policy has been determined from the preliminary showing of the possibilities of the operation, the split in the stumpage account into the two separate stumpage accounts, is simply made. If, in the first cutting cycle, the operator removes 50% of the board foot volume and thereby removes 80% of the total possible maximum realization per acre, the unit depletion rate for the first cutting is four times that of the material left standing. In other words, the unit depletion rate of the stumpage account for the first cutting cycle (above the diameter limit) is 60% more than the 1913 unit value and that of the material left is 60% less.

It has not been possible so far to secure complete endorsement of a comparable position for the treatment of depreciation of plant and other physical property. One reason for failure lies in the fact that the problem of depreciation is not as clear cut. However, we have received general recognition of the soundness of our position and I feel confident of ultimate success. In the ordinary case it is probably much safer to take the position that the railroads should be entirely depreciated on the volume of timber in the first cutting cycle. This in spite of the possibility that there will be some salvage of railroad value for the return cutting. Again, this must be a question of fact in each case. However, quite obviously the depletion rate is not a safe guide, that is to say, railroad depreciation would not necessarily follow the ratio of depletion values in the two stumpage accounts. With the actual plant facilities both the possibilities in depreciation and the fact vary widely. Where the preliminary report has shown a greater net gain for the whole operation by cutting the first cycle timber into lumber and selling the remaining property in producing condition (the case with many short-lived operations) and where such a policy is adopted, the plant must be depreciated entirely on this first cut, i. e., with the illustration above, for depletion, the plant must be depreciated on 50% of the total volume.

Where the life of the plant is increased because of the cutting of more wood material made possible by the reorganization of the operation into two or more cuttings with the intervening growth of the remaining trees, radically different situations are encountered. This may either be in the form of continued amortization on the basis of a larger amount of material (such as a total increase of 20% or 30%) or it may be necessary in cases to go back to actual "depreciation" on the basis of physical life. The policy and procedure with depletion is clear cut and approved. The policy and procedure for depreciation will require more study and negotiation.

### A SUCCESSFUL EXAMPLE

By W. H. SULLIVAN

(NOTE: This account of the Great Southern Lumber Company's reforestation project in Louisiana is included in FORESTRY IN WISCONSIN as an example of forestry by private owners in connection with established wood-using industries. Similar undertakings are being carried on by other Southern Pine operators; also by Spruce pulp operators in New England. Projects of a similar character are developing on the Pacific Coast where there is a movement to place the Fir industry on a sustained yield basis; the Redwood industry of California is already on this basis. Unless our forest areas are put to use, our wood-using industries will disappear while in regions like Bogalusa they will continue permanently.—THE EDITORS.)

Our operation in Bogalusa is only twenty years old. In an undeveloped timbered country twenty years ago in Louisiana the Great Southern Lumber Company owning extensive areas of virgin timbered lands built a sawmill in the valley of Pearl River on Bogue Lousa Creek, and around this sawmill as a base, laid out a town along broad lines and called it Bogalusa, now a city of 16,000 inhabitants. At that time this was the biggest sawmill under one roof in the world.

In the early stages a careful and systematic study was made of the common question of what is known as woods and sawmill waste. These investigations disclosed that sawmills generally, including our own, were utilizing only about 36% of the trees cut for lumber while the 64% either remained in the woods in the form of tree tops and stumps or went to our huge refuse burner in the form of slabs and edgings. Therefore, rather early in our enterprise here we set out to so shape our policies as to utilize waste. Subsidiary

industries, including extensive paper-making plants, succeeded in utilizing at least an additional 30% of what was former waste in the manufacture of container liner and Kraft paper. Other waste saving devices such as lath mills, box shook and shingle mills, and broom handle factories have from time to time been installed, which resulted in further reduction of waste. At this time we are operating the original sawmill at the same capacity as in the early stages with the waste burner discarded.

Having thus realized the possibility of wood for pulp as well as for lumber in the South, our attention, about ten years ago, was turned toward the forests and cutover lands and the possibilities of utilizing the great cutover land area following in the wake of logging. Investigations had shown us profuse and rapid growth of pine trees in this section of the country wherever conditions were so regulated and maintained as to secure and maintain reproduction.

It was no small undertaking to overcome the enemies of forest growth which through custom had mastered the thinking of people throughout the country. Indiscriminate grazing and forest fires were handicaps of any ambitious forestry program. Better methods of logging with the view of conserving sufficient natural seed fall have been accomplished. Adverse legislation and confiscatory taxation on second growth timber lands had to be met and overcome.

Since the year 1920 on thoroughly denuded, cutover lands near Bogalusa, we have planted by hand 16,000 acres to our three common species in the South—Longleaf, Slash and Loblolly, and in our nursery this year we are undertaking to grow at least 10,000,000 seedlings which will be sufficient to add an additional 10,000 acres to our young, hand-planted pine plantations.

While we have planted 16,000 acres, we have secured natural reproduction on an area ten times as large.

A noticeable feature is that more respect is accorded the young forests planted by hand than where natural stands have volunteered unaided by human beings. Our trouble with incendiary fires is practically all confined to the latter class of forest growth. Whether the effect of symmetrical rows and uniform growth inspires a sense of value or the fact of having had a part in the work of planting has created an interest on the part of the public, is hard to say, but there is a perceptible difference in the number of fires originating on the respective areas.

At considerable cost and time, in the hands of foresters, a careful cruise or forest inventory has been made of all forest growth by my company, with growth or yield tables in hand that have been carefully worked out to show the volume of growth both in cords and board feet, on the various aged stands, available in cycles of five years for future operations. Such tables of future yield are proving helpful in determining policies necessary in putting the entire operation on a sustained yield basis.

With four or five hundred thousand acres of different aged stands of reforested lands, under scientific forest management, within a radius of seventy-five miles of Bogalusa, we have no doubt good reason to count on a perpetual operation. Especially so, since there is still remaining a considerable area of original uncut virgin Long Leaf Yellow Pine.

## TWO TIMBER CROPS IN SIXTY YEARS

BY CARL FOLL

When I was fourteen years of age in Germany in 1870, my grandfather deeded me an acre of hazelbrush land. I cleaned off the brush and in 1871 planted it with yearling Norway spruce  $3\frac{1}{2}$  feet apart each way. Ten years later these trees had made such a good growth that my father paid me \$145 for the acre of land.

That money brought me to America and I had \$15.35 left when I got to Deerfield. I have farmed there for forty-five years and as assessor of the township have studied the lands carefully. Almost every farm in the Town of Deerfield has some land, either too rough or too wet to cultivate. Either of these types of land can be made into a valuable wood lot. The rough lands need planting to the proper species and fencing to keep out the cattle. The marshes need two to three feet of drainage in addition to this.

They may tile drain small portions of these peat marshes for farming with profit. I did that, and it was the thing that made my farm. I needed more tillable land to raise corn for my silo. Farmers who have enough tillable land now had better give their marshes only partial drainage and plant them to white or black ash, poplar, or swamp oak. In twenty-five or thirty years these forests will be worth money. My father sold my acre of Norway spruce thirty years after it was planted for \$295. The timber was used for vine-

yard poles and the ground was planted to spruce again. In 1931, sixty years after I planted my first crop, the second crop will be ready to harvest, and will bring about \$300 an acre again. That pays better than farming.

## CHAPTER V

# FIRE CONTROL IN WISCONSIN

## FIRE SUPPRESSION

By FRED W. LUENING

We have talked for twenty-five or fifty years about the beauties of nature and the inherent right of childhood to part of the forest, have painted lovely word pictures about the out-of-doors, but have done nothing. The reason for that is simple. Men do not generally do things merely to improve beauties of nature—they do things for profit. It may sound materialistic, cold-blooded, but is a fact. Those things we really get after are those things that make us a living and get us profit. Since we are beginning to sense, through our business organizations, that there may be a good business future and profit in forest growing, we feel convinced that we will have forests.

Referring to my particular corporation, The Milwaukee Journal, we are tremendous consumers of forest—I think it is forty acres for every Sunday edition—so we think it is vitally important that the forests be perpetuated. We don't cut Wisconsin forests for our newspaper, but get it out of Canada, our production agency being the Spanish River Pulp & Paper Company, but just the same, through that agency and through our newspaper in Milwaukee, we endeavor to perpetuate forests and protect them.

There need be no disastrous forest fires in the Lake States for the simple reason that the forest areas can be patrolled and protected by exactly the same business methods that are used in municipalities or elsewhere, by applying industrial contrivances such as are on the market today against fire. They are the product of business and can be used not only to cut down, but to practically stop the fire losses in the Lake States—this may not be true everywhere.

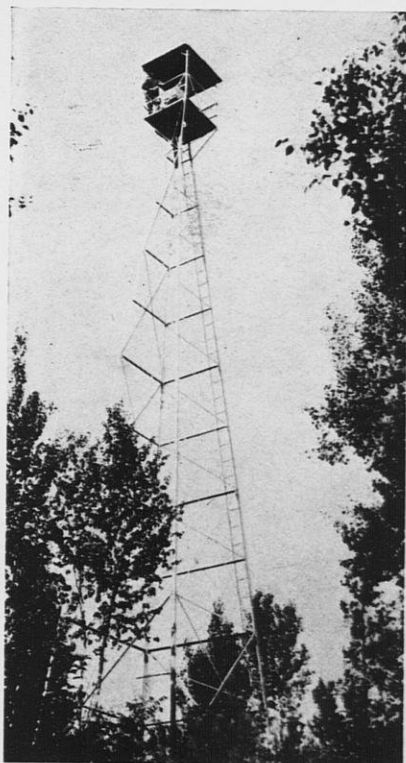
We made a little experiment to convince ourselves of the practicability of that thing. We selected an area in Upper Wisconsin and asked a lumberman to set aside a tract of typical forest, set it afire and let us attempt to put it out. We went to the manufacturers of Evinrude Pumps and to the Harley-Davidson Motorcycle Company and asked them whether it was possible to get riders to drive





#### FIRE FIGHTING

Attacking forest fire with pump and hose lines. Photograph furnished by Evinrude Company.



#### FIRE TOWER

One of 72 towers from which fires in Wisconsin forests are located. Tower is 82 feet high and connected to headquarters by telephone.



TWELVE YEAR OLD SLASHINGS REPEATEDLY BURNED OVER

There are two million acres of hardwood and pine lands like this in northern Wisconsin, which with fire kept out and supplemental planting will produce a valuable forest crop.

a motorcycle through a considerable forest, whether a motorcycle would hold up under forest conditions and if they could carry fire pumps and hose and they said they thought that could be arranged. A Chemical Company of New York came to us when they heard about this with the claim that chemicals could be practically used in forests against fires.

We gathered up our equipment and went to this place in Wisconsin. We found that the lumberman had set aside a typical area, but very carefully picked it on a highway with a very good river on one side and a creek cutting across on the third side, so he had his fire confined in a triangle, taking no chances with his neighbor or with this outfit of fire fighting fools that was coming up to fight a fire with a theory like that. Not only that, but before the movie fire was created, there was assembled a very well picked crew of woodsmen who stood by with adequate tools to take care of it after we failed in our fight with that blaze.

The brush was piled, it was dry, and the fire was set. It burned wonderfully, swiftly, but it had hardly gotten under way when the woods crew shouted "Get started or you will burn the country up", so whether we wished to or not, it was up to us to start the pumps and chemicals. We started and in half an hour that fire was out, of course. I think a good bucket brigade could have done as well. I was rather discouraged, having brought up a lot of expensive equipment at some cost, but we climbed into the automobile and headed back to town. I was reflecting on our failure when I looked up into the sky and saw a cloud floating there and wondered why it was there. It was a clear, bright day and as I watched, the cloud gradually tied to the land, a column of smoke. I looked at the lumberman and said: "I don't wish you any bad luck, but I hope that fire is on your land, Bill". When we got to town his telephone was ringing, calling for men because there was a serious fire on his land.

About five minutes later, our motorcycles chugged into town, the boys thoroughly disgusted with the whole situation, and I pointed to the north and said: "Boys, there is a real fire, now let's go!" Those boys on motorcycles just leaped onto the highway and tore up the five miles they had to go to find that fire. They found it, a typical Wisconsin forest fire with an approximate frontage of a mile and one-half. It was apparently of incendiary origin, set by

disgruntled employees of the company, started in four or five places and burning in beautiful shape under perfect fire conditions. There were no roads now, no known water supply, no place to take the motorcycles or pumps or hose lines and do a thing with them, except such conditions as we would normally find in the forest country of Wisconsin. Those boys on the motorcycles had the joy of their lives, hitting what looked like an old logging road, a sort of trail, leaped at it, made forty or fifty rods when they came to some down timber, a log or two, raised the front of the motorcycle, went over that, and finally went into muck up to the hubs, got stuck, jumped off, pulled out and at last they sank to the hubs and stopped on the banks of a little creek.

That is a typical thing in Wisconsin. There is mighty little territory not watered by some sort of lake, pool, stream, river, etc. We threw the pumps into service and in a little while the 'rip, rip, rip' of the pumps was going through the forest, out of that pool, and in the meantime we carried other pumps through the forest and the chaps on the motorcycles used the hose lines with tremendously good effect. Those little pumps throw a stream not very dissimilar to the stream used by a city fire department.

By and by the woods crew got there, real fire fighters, who went at it in the old accepted way, started a back fire at one place, (a back fire to me is just another way of burning up some more forest), cut down some trees, brushed out places where they thought they might make a stop, went into it with spades. They did not continue very long because when they saw those streams beginning to rip the bark off of the dead trees, literally wiping out that fire, following it up, leaving charred embers in the trails of the stream, they came over and said: "Say, fellows, would you mind letting us have those hose lines?" And that crew had the time of its life for the next two hours. They succeeded in checking that blaze without material loss, and the blaze was well under way.

This experiment was successful simply under those circumstances, perhaps because the circumstances were not chosen. Our movie fire was all over when we got there, but this was a real forest fire. That is the way to work to check and stop the forest fires of the State of Wisconsin, exactly as we go to work in our municipalities. Conditions are not as different as they may seem on the surface. The first thing we do is mark out our water areas, survey

our territory, to be sure it is the territory in the city but similar territories prevail also in the forest, and by surveying, properly locating water sources, putting trained men into districts, an area can be protected.

Fire protection is primarily the duty of the State—we do not ask that the manufacturers in cities maintain a private fire department to protect their plants—we get together and maintain fire fighting equipment by general taxation. How the taxes to start it shall be spread is another question—perhaps a spread that will include the holdings of a large faction, so that it, rather than the general public, pay a heavier share. Fire fighting in all history has never been looked upon as a private undertaking. It is a job for the State and if Wisconsin is to compete with the fire evil, the responsibility of the public must be included in my subject.

First of all, the public must get over the idea that it may set a fire wherever it pleases in the forests of Wisconsin. In the city we don't set a fire in the heart of a lumber yard, yet a lumber yard is only trees cut up and piled, but we don't consider them as sacred as long as they are living things and growing; only when they are cut up into lumber are they properly protected. I stayed one time on the shores of a small island up in Canada and on a quiet day the smoke went straight up from my little fire. In about fifteen minutes a plane came out to see why I had started a fire without a permit because they require a permit to start a fire up there. Of course they do start fires without permits, but the rangers are there if they can get there, and during the week I was on this island the plane simply made it a part of its business to fly over my island to see what I was doing there.

The responsibility of the public lies in keeping fires out of the forest in the first place, and the minute a fire is started should help to put it out. The great trouble in Wisconsin is that they don't begin fighting the fires until sometimes the next day. Fires in the forest should be treated exactly like fires in the city. On an alarm get busy and put it out! The Peshtigo fire was permitted to burn for days and weeks before we made energetic attempts to put it out and then we could not.

I am not trying to offer any panacea that will apply to all conditions, but I would be willing to take over parts of our own holdings in the Spanish River Pulp & Paper Company in Ontario and be

assured that our fire losses would be nearly down to the minimum by the simple application of business methods and use of modern equipment to take care of these places as they arise in our forest.

## COMMUNITY COOPERATION

By CHARLES L. CECIL

A review of the efforts of the Cornell Wood Products Company in fire protection work may aid your handling of the same problem on your own lands, and by frankly admitting the weaknesses which developed in our work, it may be possible for you to avoid our errors.

It does not seem likely that any material *subsidies* for fire protection will be extended to timber land owners in any way which will tend to capitalize lack of interests in fire protection on the part of the owner of such timber lands, nevertheless in the last few years a policy of active *cooperation* has been apparent on the part of the State and Federal Governments. In 1920 there was no State field organization worthy of mention nor were any funds available to adequately handle the fire protection proposition. Today the State has the leadership in fire protection work and its field organization is being made increasingly effective. The State cannot take all of the burden of protecting private timber lands from fire and holders of timber must expect to help themselves insofar as their conditions will allow. Prior to 1920 our Company was faced with the necessity of organizing fire protection on their Wisconsin lands under difficult conditions. It was necessary to organize roughly about 500,000 acres in order to secure any fire protection at all on some 50,000 acres. At that time the State had a Ranger detailed to four Counties but no funds available, no legislative backing and very little public sentiment in favor of fire protection. Under these conditions it was possible for us to do one of two things: Either we could plan to *deflect* fires which might start in such a manner that they would not do us material damage or we could make an effort to extinguish fires in the territory. It seemed to us that the latter of these two alternatives was the one to pursue and we drew up a fire plan and maps in complete detail and then skeletonized the organization which this plan called for to coincide with the annual expenditure which we thought we were justified in making. At the

same time we actively agitated cooperation within the area on the part of the State, Federal Government and other private owners. At this time the Rust-Owen Lumber Company, whose lands lay directly east of ours, were interested in fire protection and they joined heartily in the effort that was being made. We constructed three lookout towers and considerable telephone line and maintained a patrol headquarters and in the area adjacent to ours Rust-Owen had two towers, both of which were tied in by telephone to our system. Up to 1924 about all we were able to do was to conduct a campaign of education in the territory, keep these improvements working, establish some centrally located tool caches and build up a miniature fire protection organization, largely temporary in character.

About the year 1924 the Conservation Commission began to evolve the District plan and to intensify their fire protection and suppression activities. Our telephone line and towers were tied into the State system and our men now act under the State Rangers. Our per acre expenditure prior to 1924 averaged better than 15c per acre per annum. In 1927 our cost per acre was a trifle over fourteen cents. On the basis of value the cost of this protection in 1927 to us was \$1.34 per hundred or slightly under the insurance rate on pulpwood piled at tracks in Wisconsin. I do not believe that the timber land owner can ever expect to protect his holding at a cost per acre comparable to the low figure reached on National Forests unless the private holding is comparable in area to the National Forests and the protective force utilized on other work in other than fire seasons. At the present time fire protection in our district is centered in the hands of the Conservation Commission; the area protected has been greatly enlarged and a fairly adequate tower system is connected by the necessary telephone lines. Gasoline pumps, hose line and the other machinery of a protective unit are either provided or planned for, a great deal of educational work has been done and these fire protective efforts have been encouraged by considerable cooperation from the smaller holders in the area. We could not for our own account possibly have conducted anything of this size in Northwestern Wisconsin in consideration of our relatively small holding but we were of assistance in the development of the present plan which has followed the original fire plan which we constructed.

Our interest in fire protection was crystallized by the loss in 1917 of some 26,000 cords of standing pulpwood. Since 1920, dur-

ing which year our protection began to be effective, our total loss over a period of 8 years amounted to \$3268.00 from which has been deducted losses by fire trespass for which full damages were collected. The hazard cannot be eliminated but it can be lessened. Even with the best possible organization, fires will occur that cannot be controlled prior to loss. Such fires occur in the intensively handled forests of Europe and they occur in large cities despite the best equipment which can be purchased, but a good protective system betters the expectancy to be dealt with in the fire risk. It is usually necessary to delegate the actual protection work on private lands and if you make your own fire plan and keep your own record of the information gathered, you insure to some extent against sudden changes in personell and retain definite control of the protection Agencies on your lands.

We had to have a map on a fairly large scale of the territory in which our holdings lay. A tracing was constructed so that any number of prints of the base map could be made. Such a base map is essential not only for fire purposes but to record the information which you ought to have on your lands. It should be on a scale of at least 1" to the mile. On prints of this base were recorded all the cooperative agencies available, the improvements in the area which could be used for fire protection purposes whether we owned them or not and all other information which was pertinent. We inventoried our standing timber a little more thoroughly than the average estimator does; the reports showing the local hazard, the amount of small stuff on each forty and a type map giving the age and size of the timber in each type.

A written plan listed all agencies, men, and equipment available in each subdivision of the area and valued their services according to our experience with them. We conducted an intensive educational plan in our immediate territory, made efforts to enlist all the aid we could in a general protection plan beginning with the Federal men in charge of Weeks Law Cooperation and continuing down to road Supervisors appointed by the Town Chairman. A year round practical man was put in charge of the suppression and protection end. He was educated in the theory of the thing and was authorized to hire what help he needed in dry periods. His work was checked and supplemented as necessary.

When the State became active enough to take over the Supervision, it followed the same procedure over the area as a whole, but



we have still kept a certain individuality as far as our own lands were concerned. I will be very glad to go over details of anything that we may have in this connection with anyone who is interested. The two State districts in Northwestern Wisconsin are quite well organized and the State districts which include your timber lands will progress in their organization in proportion to the amount of cooperation and interest which the State receives in your district.

I might go into a few details in connection with which our experience may be of help but the conclusions drawn are not axiomatic. Permanent fire breaks are not considered to justify the cost of construction and maintenance. Slash disposal should not be attempted either from a protective or silvicultural standpoint except possibly in rare instances over very small areas. Increased patrol for about two years after cutting is advisable and also some concentration of equipment. The first essential of efficient suppression is the plain concentration of authority at an individual fire in the hands of one competent man. This is true of any enterprise, I believe, but the lack of this principle in fire fighting work or indecision on the part of the duly selected chief is more disastrous than in most other enterprises.

## WHAT IS NEEDED

By C. L. HARRINGTON

The prevention and suppression of running fires is a basic requirement. It is the local people or local concerns or customs that cause fires. The fire risk is generally more acute in the fall than in the spring although the greatest number of fires occur in the spring. The risk is entirely dependent upon weather conditions. Such risk vanishes during the months of December, January, February and March and becomes most acute in the months of April and May and September and October. Fires are most common in sandy sweet fern plains and cut-over brush land, which in reality is the new forest. Fires seldom start in or run through the mature hemlock and hardwood timber which comprises practically all of the merchantable timber left in Wisconsin.

There are many beneficial uses for fire in the development of any region such as for clearing land, the construction of roads, the

clearing of railway rights-of-way, etc., and the occurrence of fires decreases with the development of cleared fields and roads—thus southern and western Wisconsin counties have no appreciable risk from running fires. In any part of the state the forest protection plan must fit in with the local circumstances and that the expenses involved must be compatible with the prospective gains to be made.

The fire plan for Wisconsin follows the same basic idea adopted in practically every other state where organized protection is being carried out. The plan fits in with our circumstances. It is the result of about twenty years of development and what is now needed is to bring the plan as laid down to completion and to effect a full enforcement of the forest fire laws. The revision of laws relating to forests passed by the legislature of 1927 gives us a reasonably complete and satisfactory code and lays down the forest fire prevention and suppression program.

Under this plan two main divisions of land are recognized: First. Areas of forest and cut-over land where the risk from fire is general and in season may become acute—about fifteen million acres appear in this category and include the north and central counties. The Conservation Commission has divided this area into forest protection districts, to be described later. Second. Areas of land primarily agricultural in character where sixty percent or better of the area is in farms, where cleared fields are common and the risk from fire is light—about twenty million acres in this class, which includes the southern, middle western and middle eastern counties. In this area the town chairmen are *ex officio* town fire wardens and are the responsible officers for the prevention and suppression of fire and expenses incurred are borne by the town.

Eleven forest protection districts have been laid out. The work of organizing and equipping eight of these districts is well advanced. During 1928 similar work will be pushed in the remaining three districts. The effort is fundamentally one in which the state exercises its police power to protect her citizens and their property from any destructive agency, of which fire is one and to encourage the development of all land resources, including the growth of trees. In this effort the state is assisted by the federal government through the Clark-McNary law and also by the counties through the sharing by them of one-half the cost of fire suppression. The effort, therefore, is primarily one of government with the federal, state and county units cooperating.

Under the law the Conservation Commission in each forest protection district appoints a man to have charge of all fire prevention, detection and suppression work. He is called the District Forest Ranger. He is the year-long permanent man on the job. In order to effect an early detection of fire, look-outs are erected on the commanding points and rapid communication between them and other strategic points in the district is effected by telephone. The fluctuating risk from these fires rises from zero during a wet time to one hundred during a prolonged dry spell, demanding that the field force be rapidly expanded and subsequently contracted depending upon the weather conditions. This is provided for by the appointment of from twenty-five to forty men in each district known as emergency fire wardens. These men are local citizens, generally property owners in the district, and located at strategic points. Such appointments are made in conjunction with the respective county boards. The emergency fire wardens are paid for the time they actually serve. They are the leaders of the local fire fighters and are the back-bone of the fire fighting organization.

The state with the help of the federal government assumes the responsibility in each forest protection district during times of ordinary risk. All look-outs, trucks, pumps, buildings, hand tools and other equipment is owned by the state. The district forest ranger is paid by the state and he keeps the organization going. He looks after all equipment and work to prevent fire in the first place and to suppress all fires that occur as rapidly as possible. The emergency wardens are under his charge and all bills incurred for whatever purpose must have his approval, including his own labor charges of fire fighters which are paid in the first instance by the state and subsequently one-half charged back to the county in which the fire occurred. He enforces the burning permit law, the laws relating to spark arresting devices on locomotives, and all other provisions of the forest protection laws.

The forest protection plan contemplates a steadily increasing interest and aid from all owners of land in each forest protection district. The owners can clean up slashings, the railroads are required to clean rights-of-way, patrolmen can be employed during dry times, pumps and hand tools can be placed for emergency use, settlers can be cautioned against carelessness with fire and in many other ways the owners of land can and should assist the state in

fire prevention measures. Such assistance is needed badly in each forest protection district and is always welcomed.

The chief weakness of the forest protection plan at the present time is in the dependence on the volunteer force of emergency fire wardens. Many of these men act promptly when a fire breaks out; many do not. While they are appointed by the commission in conjunction with the county boards, they do not receive pay except for the time they actually put in at not to exceed thirty-five cents per hour. It is hoped that the force of seasonal men can be increased from year to year and that the emergency wardens can be paid a nominal annual sum, say of \$100, in addition to the pay they receive for the time they actually serve, in order to place them more securely in the forest protection organization and insure their interest and acceptance of responsibility.

The work of organizing and equipping each forest protection district must go on simultaneously. To have a good force of wardens without equipment is as fatal as to have a lot of equipment without men who can use it. There is still need for considerable work in the training of local fire fighting crews in the elimination of fire risks, in the education of local people in fire prevention, in the improvement of fire fighting equipment, in the enforcement of the burning permit and other forestry laws, in the encouragement of aid from land owners and in many other directions that mean better efficiency in fire prevention and suppression. We must commence and carry to completion as far as possible the organization and equipment activities in each one of the forest fire districts as laid out.

The job we are tackling is that of attempting to protect people against themselves, to protect land owned by the other fellow who may be indifferent and even openly hostile. The hope for reasonable success in fire prevention and suppression is through eternal vigilance and consistency of action year in and year out applied to all lands in organized districts, irrespective of ownership, whether timbered or cut-over and through the observance by every man, woman and child, of the forest protection law.

## OWNERS ORGANIZATION

By R. G. FLANDERS

The Wolf and Oconto River Logger's Association is a corporation made up of logging superintendents and the principals of companies or individual operators who have their operations in the vicinity of the Wolf, Oconto and Peshtigo rivers in Marinette, Florence, Forest, Langlade, Oconto and Shawano Counties. It is formed primarily for the purpose of enabling the operators and managing superintendents to work in a co-operative and neighborly manner, bringing together foremen and logging superintendents, so as to do away with jealousies and suspicions. This has been accomplished to a very marked degree by reason of the fact that all members have truthfully told their faults and refrained from exaggerating or deceiving, so that there has arisen a feeling of confidence in one another and a purpose to help where opportunity arises and because we have not been actuated by any selfish motives we have been able to carry on for a number of years accomplishing much good.

One line of endeavor has been to accomplish a practical fire prevention program and through the efforts of the Association and its members, there has been kept before the public the need for a change of laws and a program of education that would bring such proposition nearer to a satisfactory accomplishment. Our plan of organization was accepted by the majority of the members of the Association who met here today. We have not been able, up to this time, to put our plan into operation because this plan, or any other, is only workable in districts that are organized by the Conservation Commission functioning under the arrangement that the fire wardens hired and paid for by our Association are deputized with the full authority of fire rangers. In the report, reference is made to Protection district No. 9, which embraces a large part of the territory where operations are conducted by members of this Association, and this District No. 9, up to the present time, has not been organized. But with the assurance that it will be organized immediately this spring, our Association will proceed with our plan.

This plan provides that District Supervisors for each district as assigned by the Fire Prevention Committee shall elect a Chairman and Secretary and shall meet at least once a month, reporting to the Fire Prevention Committee regularly. They shall have the

authority to hire a fire warden for their district for a period of time not to exceed eight calendar months in each year; and to furnish equipment necessary to prevent and control fires and to direct the educational program. The budget limits the expenditure by District Supervisors in any one district to an amount not in excess of \$150.00 for expense other than Fire Warden salary in any calendar month. Additional expenditure required for labor to control fires, or for expense incurred, or for equipment and material required must be authorized by the Fire Prevention Committee. The salary to be paid Fire Wardens, deputized by the Commission as Forest Rangers, shall not exceed \$150.00 per month, this compensation to cover use of a suitable car or truck provided and maintained in usable condition by warden and gas and oil to be arranged on a milage basis.

The proportion of expense by districts will be based on the number of government descriptions of timbered and cutover lands owned by the members in such district. No government description having less than ten acres will be reported and government descriptions of sixty-five or more acres will be reported as two descriptions. Eight government descriptions (as above described) of cut-over land are equivalent and equal to one description of timbered land. A description shall be considered as timbered land where it is timbered with 75 M.Ft. or more of log timber, or with other stumpage having a valuation of \$300.00 or more regardless of location. Each member will on January 1 of each year and at other times when required, report to the District Supervisors his entire number of government descriptions timbered and cutover separate in each district, scheduling by section, town and range to avoid duplication and errors. The report of January 1 of each year will constitute the status for assessment purpose.

#### FEDERAL AID

By CROSBY A. HOAR

The Federal government has been cooperating financially with the State of Wisconsin in the prevention and suppression of forest fires since 1911.

Federal cooperation is governed by Sec. 2 of the Clarke-McNary Law. This is the same act which provides Federal coopera-

tion with States in growing and distributing forest planting stock, in extension forestry and in the study of forest taxation.

Thirty-four States are now receiving Federal cooperation in fire protection. Present estimates indicate that about \$10,000,000 a year would be required for reasonably adequate protection in the United States. Adequate protection is not an exact term, but a reasonable objective would be not more than one-half of one per cent of the area under protection burnt over each year. This would mean for Wisconsin about 70,000 acres burned area annually. Based upon incomplete reports in recent years, the area known to have been burned has varied from 12,000 acres in 1927 to 528,000 acres in 1923. Favorable weather conditions were partly responsible for the good record in 1927. The test of adequate protection comes in years of high hazard for which we are by no means prepared.

The estimated cost of adequate protection in Wisconsin has been tentatively set at about \$320,000. This figure may be too low. It is not likely to prove too high. At the present time, State funds available for protection total about \$101,000 and Federal funds an additional \$31,000. The Federal government hopes to be able to carry about one-fourth of the cost of adequate protection, leaving the remaining three-fourths to be made up from State funds, supplemented by private funds if such are available.

Michigan has \$150,000 of state funds; Minnesota \$185,000; both of them have a decided start on Wisconsin in that they began some twelve years ago to build up a more adequate organization than has yet been possible here. It takes time to build these things, men have to be trained, profit by experience and training given them and we don't achieve success with any amount of money in one or two years. Adequate detection means a system of towers connected by telephone lines, observers on those towers constantly during the fire season and I predict a need for 115 towers in the State of Wisconsin.

There is gradually being built up something approaching a science of fire protection; it is no longer a hit-and-miss proposition. Mr. Luening hit pretty close to the fact when he said we are discarding the shovel. We are getting to rely upon, first, quick detection, followed by quick suppression, trained crews, motorized, able to get to the fire areas in the least possible time, fighting the fires

when they are small with much better prospects of success. We are getting away from hand tools, in favor of pumps and motorized equipment including in some cases even tractors, draw plows, so that we can make a few well-trained men do the work of large crews using only hand tools.

The plan announced by Mr. Flanders, in which the Wolf River Loggers' Association will cooperate with the State in protecting the forests of its member companies is very encouraging to all State fire wardens, not only for the actual help promised but also as a demonstration of direct interest and moral support. Similar organizations of timberland owners in Minnesota, such as the Wales Forest Protective Association, mentioned by Mr. Sensenbrenner, have been of great help to that State and have established high standards of protection. There is no reason why they should not be equally successful and helpful in Wisconsin.

## PREVENTION

By A. L. OSBORN

I have lost my eyebrows fighting fires that ought never to have been started. I have seen timber destroyed here, thousands and thousands of acres that ought to be standing and growing today. I have seen the treeless wastes as you all have and regretted it, and no one so much as giving thought to his passing along in the forest and throwing away a match, cigar or cigarette, or when out camping, to putting out the fire. I have seen the railroad engines of the railroads in the State of Wisconsin running up and down their tracks emitting volumes of fire that scattered ruin and desolation the length of the track, burning up millions and millions of tons of goods that they ought to have either now or later transported. I have protested to the president of one railroad and told him what he was doing and I was told that the engines were inspected when they went into the roundhouse and all found to be in good condition.

Such criminality, such utter disregard of peoples' own interests is inconceivable to me. I have seen settlers who wanted to get merchantable logs set fires to timber belonging to someone else, that have destroyed thousands and thousands of dollars worth and no end of prospective growth. I have seen lumbermen just as heedless and careless as railroad people and settlers, campers and stragglers.



I am a crank on prevention, not on fighting fires after they start. In the years that we have a prolonged drouth (they come once in eight or ten years, in cycles apparently) there comes a day when there is no moisture in the air; when we have such a drouth with a tremendous gale from the southwest fires spring up as if by magic. If there is not care in the prevention of fire, we will have many idle acres where we might have growing trees. We can do much good in the way of fighting fires after they have been started, but the root of the question is to get people not to start fires.

### HOW IT CAN BE DONE

*By F. J. SENSENBRENNER*

In association with another Wisconsin paper manufacturer, our company owns a considerable stand of Spruce timber in northeastern Minnesota. After several serious fires in our district, at the instance of State Forestry officials, realizing the inadequacy of available State funds, and under the leadership of the manager of our Minnesota company the Wales Forest Protective Association was organized.

To secure proper protection from neighboring fires, it has been found necessary to include within the patrol limits of this Association about 700,000 acres, despite the fact that the members of the Association owned only about 20% of this acreage, and the State owned about 10%. In 1921, shortly after the formation of the Association, and before it was thoroughly organized and equipped, there were nearly 8,000 acres burned over out of the total area, involving a loss of \$56,000.00. Since then the losses have been steadily declining until the last few years they have been practically nothing.

Taking 1924 as an example, the amount expended by the Association in the protection of its own lands was 49%; miscellaneous owned lands 26%; and State lands 25%. The annual expenditures now amount to about \$22,000.00 per year, or about 14c per acre of the lands owned by member companies. The total amount expended in this work by the Association in 1922 was \$8,209.00, against expenditures by the State of \$2,206.00; in 1923 by the Association \$22,024.00 and by the State \$1,346.00; 1924, by the Association \$22,268.00, by the State \$1,105.00; 1925 by the Association, \$22,800.00, by the State \$585.00. Since then, because little or no further invest-

ment is required in equipment, the expenditures by the Association have been at the rate of \$20,000.00 per annum.

The Association employs during the season of fire hazard from sixteen to thirty men; owns one headquarters camp, seven patrol cabins, six lookout towers, eighty miles of telephone lines, four railroad motor cars, one railroad push car, one railroad velocipede, two portable gasoline pumps, twenty-five hundred feet of hose, two auto trailers, and a lot of other tools, including shovels, axes, pails, tents, etc. During 1925, it patrolled forty-seven miles of railroad, twenty-five miles of county road, and sixty-five miles of trails.

A brief statement as to the number of fires in the Wales District with an account of the organization and operation may be of interest. I quote from the Association's report, greatly condensed:

<i>Year</i>	<i>No. of Fires</i>	<i>Area Burned Acres</i>	<i>Total Damage</i>
<i>Without Protection:</i>			
1919 .....	7	4,127	\$17,160.00
1920 .....	21	635	3,022.00
1921 .....	30	7,979	55,886.00
<i>With Protection:</i>			
1922 .....	6	1,097	2,223.00
1923 .....	16	1,700	985.00
1924 .....	12	170	34.00
1925 .....	11	3,042	1,261.00
1926 .....	10	838	3,648.00
1927 .....	13	8	2.00

In the selection of patrolmen or observers, preference is given to the more intelligent class of common woodsmen from 30 to 45 years of age who have had several years experience in the logging industry. They are paid from \$75.00 to \$90.00 per month and board. The association uses the Evinrude 4 H. P. gas pumps and 1½" canvas hose in its fire fighting. Such pumps are mounted on frames so they can be carried over trails by two men. The No. 2 long handle shovel is preferred for fire fighting, while light short handle shovels are used for patrol work. Double bitted 3½ lb. axes are preferred to a heavier axe, and twelve quart galvanized pails which nest easily. A tent which will shelter from 12 to 16 men can be carried by one man. There are various kinds of hand pumps for use in mopping up fires. Such air pressure pumps as have been used do not seem to be desirable and the best results ap-

pear to be given by the type from which the water is pumped direct. Additional equipment consists of blankets, cooking utensils, 3½ foot one-man saws, mattocks, etc.

Fire plans include all maps of the district with detailed information as to trails, telephone lines, cabins, location of settlers, camps, tools, tote and logging roads, streams or water holes, where to find fire fighters, etc. Some of the tower and patrolmen's cabins are built of logs and some of lumber. The usual size is 16'x24' with 8' walls. Ground telephone lines through the woods are preferred for these lines are easier and cheaper to build and less liable to get out of order than the double metallic lines and give good results for short distances, up to fifty miles at least.

It is obvious that lookout towers should be located on the highest places where an unobstructed view of the surroundings can be obtained. Towers should be placed so that cross readings on fires can be obtained advantageously. In the Wales district which is a rolling country, they are most efficient when not more than fifteen miles apart. Steel towers are from 60 to 80 feet in height with enclosed cabins at the top and are preferable to wood towers. Trails should be cut about eight feet wide. When trails are bushed out in the Fall of the year, they do not become obliterated by new growth as soon as those cut in the Spring or early Summer.

The railroad motor cars in use are those constructed by Fairmont Railway Motors, Inc. The 4 H. P. type is sufficient for inspection and patrol work and the 6 H. P. with trailers to transport men and equipment on fire work appears to be of ample power. Patrolmen whose work is along roads should own their own automobiles and mileage is allowed them while on duty. Weather instruments are established by the U. S. Weather Bureau and consist of recording instruments for wind velocity, rain and humidity, the latter being of great importance.

The State Forest Service cooperates with the Association through the appointment of our patrolmen as regular forest officers with power of arrest in case of forest law violation and furnishes one patrolman during each season. Cooperation from tourists fishermen and hunters is of the utmost importance though their help must usually be enlisted before they reach the forest through pamphlets, lectures in municipal and other tourist camps, and signs placed along their usual routes of travel. Weather Bureau cooperation is estab-

lished on the basis that the Association forwards weather observations and the Bureau furnishes the Association with weather forecasts daily or more frequently in periods of great hazard.

The elapsed time from the discovery to starting actual work on any fire should be measured in minutes, not hours, and a constant effort should be made to reduce the elapsed time on every fire. While trails leading from the railroads or highways into the adjacent country cannot be made to lead directly to the scene of every possible fire, they should be so run as to enable fire fighters to get to the scene of the fire in any part of the district at the earliest possible moment after the fire is discovered. During dry periods occupied by a high wind fire fighting is very difficult. In such cases the fire is best brought under control by working until very late in the evening and beginning again very early in the morning, thus taking advantage of the usual dying out of the winds and the increased humidity during the night time. After a fire has been brought under control it should be put entirely out and patrolmen be stationed on the burned area for several days thereafter and until certain that every last ember is dead.

Along with the Forestry Department of the State, the Association has worked upon the theory that the disposal of slash can be better and more safely accomplished in unsettled areas by cutting it up and getting it close to the ground where it will gather and hold moisture and quickly decay, rather than by burning. It is a fact that the introduction of fire is a more serious hazard than the hazard of the unburned slash if a close watch is kept upon the unburned slash in dry periods. By burning the slash, the soil is damaged, seeds are destroyed and either natural or artificial reforestation is hindered. Along logging railroads, highways and around camps where carelessness of others might ignite the slash, fairly clean burning is insisted upon.

## CHAPTER VI

# THE FOREST CROP (TAX) LAW

## ITS PURPOSE

By GEORGE W. BLANCHARD

You are now considering one of the most perplexing problems connected with forestry. A tax law may be theoretically and economically sound and yet may fall far short of accomplishing the results intended. Forestry taxation may be destructive or it may be constructive. Wisconsin's Forest Crop Law was designed to open up the doors for the doing of the very things you have been discussing here. What is the use of talking selective cutting, artificial planting and fire prevention from the standpoint of commercial forestry if tax laws would result in a loss to the operator over the period of years required to make trees merchantable. That doesn't mean that timber now ready for cutting should be given the benefit of any of the concessions of more liberal tax laws, but it does mean that if timber operators, lumber men, farmers and land owners will grow trees and thereby insure our timber supply, provide the raw material for our mills and factories and keep our thousands of employees in the industry employed, add millions to the wealth of the state, keep our streams and lakes supplied with pure water, provide the very foundation of our whole conservation movement, insure our supply of fish and game, in other words keep us on the incline rather than the decline, then the State can afford to advance money on a project of that kind and wait for its return until the timber is marketed.

Ten cents per acre per year is what the State pays, and that to be returned in the form of a yield tax when the timber is cut. If we had our whole waste acreage of 2,000,000 acres registered today and it continued for fifty years without a dollar returned we would only have invested \$10,000,000. We raise for highways from the gas tax and license fees for autos alone more than that amount every year. If some insurance company would insure our future timber supply at \$200,000 per year this State or any other state could well afford to pay the price if they never got a dollar back. And if Wisconsin's Forest Crop Law results in the registration of all or the

major portion of its waste land, and if under proper administration our forests are perpetuated then and only then may it be said to be successful legislation.

Applied to Wisconsin it is legislation for the purpose of perpetuating an industry that employs 116,000 people, represents an investment of \$423,000,000, and has an annual output of \$463,000,000.00. To continue our past policy means more waste lands, denuded forests, wrecked communities, and that's progress in reverse gear. Let's not tax property out of existence—let's tax it into being!

(NOTE: Senator Blanchard is chairman of the Wisconsin Legislative Interim Committee on Forestry and Public Lands which framed the Forest Crop law. This committee held a number of public hearings, consulted tax economists of the University of Wisconsin and of the U. S. Forest Service, county officials and timber growers. The entire committee worked over the provisions of the law continuously for many weeks before reporting it to the legislature. Its passage was practically unanimous.—THE EDITORS.)

## ITS ADMINISTRATION

By EUGENE WENGERT

I shall attempt to bring under this topic the outstanding features of the Wisconsin Forest Crop Law and discuss a little of the economics of the new industry of raising trees. This new industry is just beginning to come to the front. Heretofore very little thought was given to the undertaking of growing trees. It was just supposed that trees grew without any cultivation. The Nation did not realize that the virgin forests would one day disappear. No doubt lumbermen were held under the spell of illusion that there would be no end to his industry. He could not have freed himself from the grasp of his environment. He built sawmills, cut the forest and then moved on to a new frontier. Because he was so close to the forest, ever looking forward and never backward, he did not see the disappearing forest line on the horizon.

It was the layman looking on from a distance who first raised a warning about the dwindling forest and urged legislation by the National and State governments to encourage the planting of trees. The adoption of such laws mean the overthrow of a deeply rooted taxation policy of long standing. I think the fundamental principles in any law attempting to encourage growing of timber must be based upon the philosophy that growing timber is the same as any

other kind of crop. While other crops recur periodically with the advent of the seasons, trees require scores of seasons to mature. Naturally, therefore, tax systems dealing with this new industry must be so arranged that they proportionately place no greater burden on the grower of trees than on the growers of any other crop. If agriculture were to be taxed on the same basis as the growing of trees has been in the past, then the annual crop would have to be taxed weekly. I believe this similarity is now coming to be recognized; at any rate, it is in our Wisconsin law.

Attempts have been made to embody such principles of taxation so that payment of any tax was postponed until the harvest takes place. The burden of paying taxes for the timber grower must be in harmony with the taxation principle of ability to pay. This, I think, we have nearly accomplished in our Wisconsin Forest Crop Law. The law provides in its preamble that its purpose is to "encourage a policy of preserving from destruction or premature cutting the remaining forest growth in this State, and of reproducing and growing for the future adequate crops of forest products on lands not more useful for other purposes, so that such lands shall continue to furnish recurring forest crops for commercial use."

I shall outline briefly the operation of the tax law as it applies to those who wish to register lands under it: After the registration, the Conservation Commission determines whether the lands are primarily adapted to the growing of forest crops and I might say here that the Wisconsin Commission has adopted a very liberal policy in the registration of land under the law. It has gone so far as to include forest lands where the process of selective logging has taken place. This is in accordance with the broad purpose of the law: "the law shall not only encourage the growing of trees, but prevent premature cutting". The procedure of registering under the law is very simple and the requirements have been made very easy where the Commission had discretion to prescribe. After the Commission has determined that a stand of merchantable timber will be developed on such lands within a reasonable time and that such lands are to be held for the growing of timber, then the advantages of the law immediately become effective and attach to the land for a period of fifty years. This is a contract with the State. It cannot be altered or modified by the action of future legislatures and even after fifty years the benefits of the law may be extended by mutual consent.

What are the advantages? Immediately after the land is registered for the growing of timber, the timber thereon is no longer considered part of the real estate for taxing purposes. The real estate must be taxed cheaply and growing timber not at all. Secondly, the local taxing authorities have no further control over such lands nor over the growing timber crop for taxing purposes. These lands are placed in charge of the Commission. This arrangement assures equality as to taxation policy. Thirdly, tax on real estate is permanently fixed in the law as is also the tax when the timber is cut. The tax on the real estate is 10c per acre during the life of the contract. This is not left to local taxing authorities. To compensate the local governmental units for any loss of tax revenue, the State pays out of the general treasury to local unit 10c per acre. Thus there is paid 20c per acre as real estate tax. I believe this is low enough to encourage the land owner to register the lands. It certainly should be an inducement since generally 10c an acre tax is considerably lower than the rate of taxation on land not registered under the law. While the owner is paying this tax, his timber can grow and he may have peace of mind, free from the harassing spectre of the local assessor.

Finally, after some years, the crop is ready for harvest. He now pays a severance or yield tax, but again this is not left to the chance or whim of the local assessor. When he is ready to harvest the crop, he notifies the Conservation Commission that such is his intention. The Commission then determines a reasonable stumpage value of the wood product as usually grown in several towns in which the crops lie and if there is any material variance in stumpage value in the different communities, the Commission fixes zones for the purposes of equalizing value. When once fixed the Conservation Commission notifies the Tax Commission which proceeds to levy a 10% tax on such value. This whole procedure assures equality before the law. Nothing is left to chance and in case of a disagreement between the owner and the Commission as to value, a simple arbitration method is provided and resort may be had to the courts if that fails.

At present approximately 50,000 acres have been or are in the process of registration under the law. The Commission realizes that its policy toward the law must be liberal. A new industry must be nursed and the Commission is willing to play "wet-nurse". The law



itself is liberal in all its features touching the interests of any one who has determined to invest private capital in this new industry and become a timber grower.

## ITS APPLICATION TO THE LUMBER OPERATOR

By JOHN SCHROEDER

The public does not appreciate what it means to the operator to carry cutover land. In checking over some of our lands I find an example where we are paying one-third of the value of that land in taxes per year. This shows it would be suicide for the lumber operator to attempt to carry cutover lands over any definite period.

The Forest Crop Law has been explained quite thoroughly by Mr. Wengert. It has a cumulative effect that gives the lumber operator a breathing spell, so as to speak. It allows selective cutting and while selective cutting has not been carried on intensively, nevertheless it can be developed; it has been carried on in Europe for some time and I think that in time it will be worked out favorably here. This forest crop law will naturally interest the large operator rather than the small operator. He can reduce the fire hazard through selective cutting and will be better able to handle his brush disposal.

In a recent questionnaire sent out to lumber operators of the State, it was discovered that a great majority were interested in the forest crop law. Some of the questions in this questionnaire are as follows: The first was: How many were willing to enter land? And it showed a majority were. The next item asked for suggestions for improving the fire service and co-operation with the State organization. Some operators in Wisconsin have their own organization and all are willing to co-operate with the Conservation Commission; some suggested that settlers be given the opportunity to patrol the areas and another suggestion was made that the people in the cutover areas be educated along the lines of fire prevention. The question of natural reforestation was brought up in this questionnaire and it showed that except where the land has been burned over quite thoroughly natural reforestation would take place, if given the opportunity and fire were kept out.

In our own operations in Ontario we have observed White Pine come in as second growth—the fire was kept out as much as possible—and it proved that something could be done in this area. We

started cutting there about fifteen years ago and in going back over these areas which were cut twelve or fifteen years ago, we find remarkable second growth in practically all cases. Our company had five hundred acres in Vilas County on which we did selective logging in order to leave a fringe of trees around the lakes to beautify them and enhance their value. We left plenty of growth to take care of natural seeding and patrolled for fire. It worked out very well, both from a conservation standpoint and also from a financial standpoint.

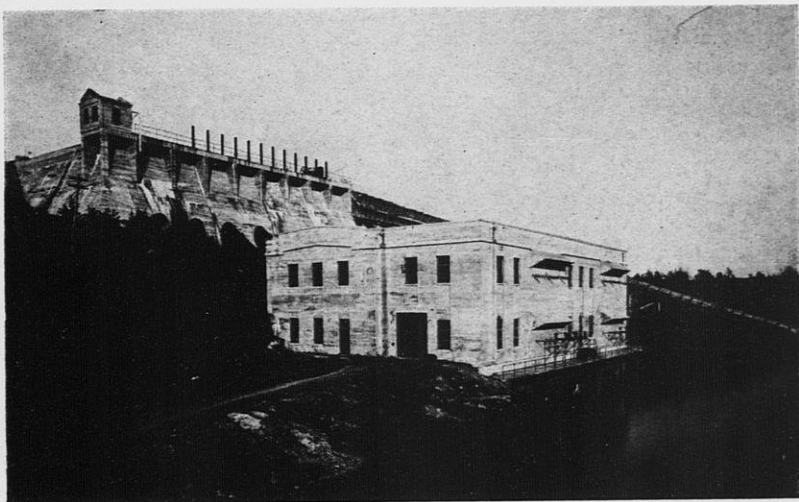
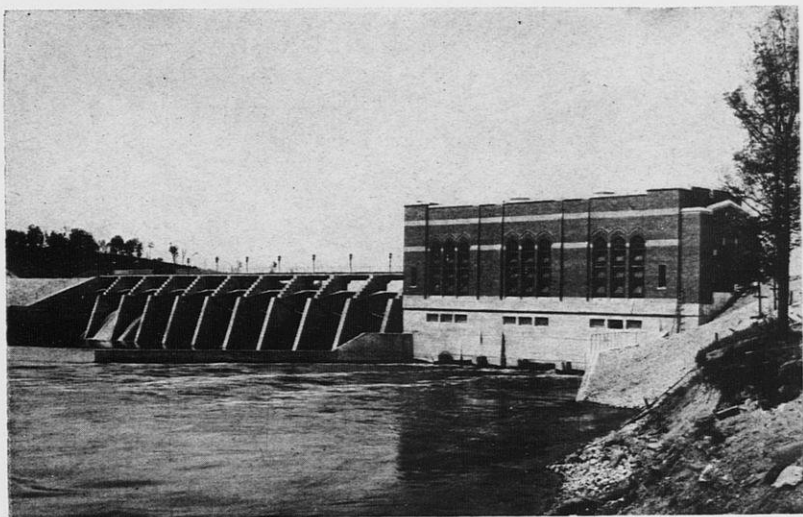
I am sure that all lumber operators are very much interested in the forest crop law and are happy to have their greatest problem, taxation, in process of solution.

### ITS APPLICATION TO THE PULPWOOD OPERATOR

By W. R. WHEATON

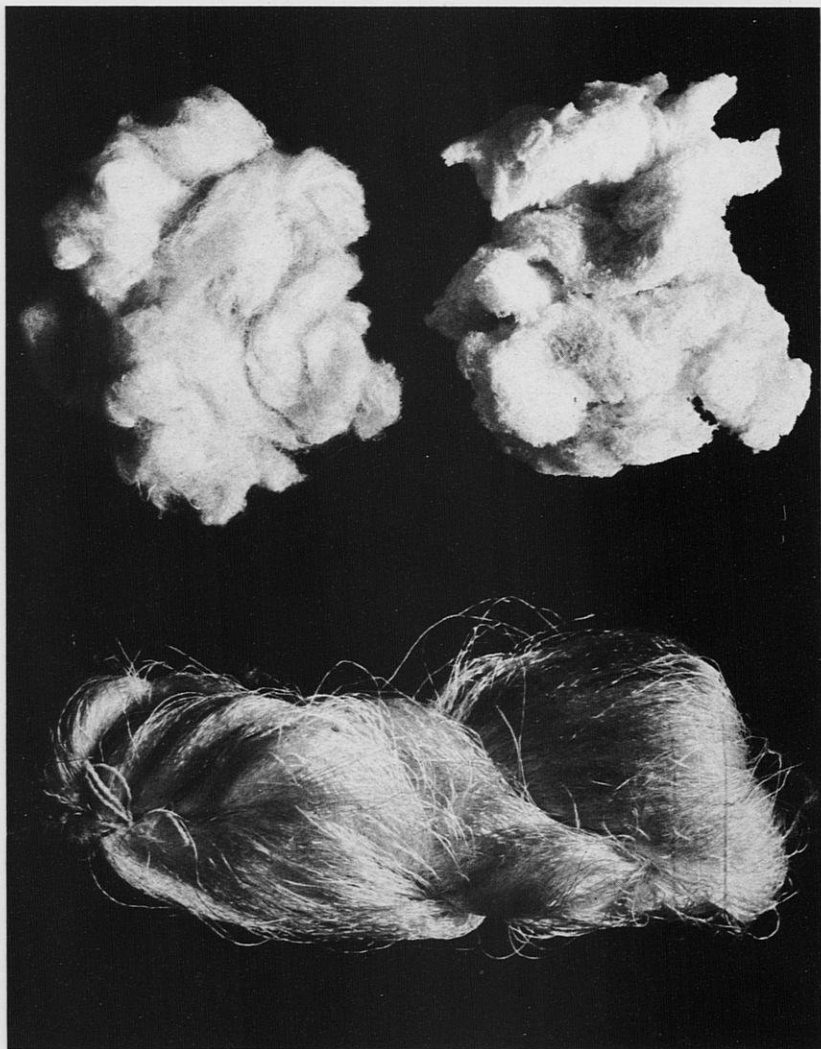
To date the Conservation Commission has applications on file for 61,555 acres of land to be filed under that law. Of this amount, 19% is by lumber companies, 47% by paper mills, and the balance of 34% largely by small land owners, who undoubtedly expect to market a large portion of the products of those lands, in the form of pulp wood. I know of 40-50,000 acres of land which will be filed in the near future by parties who expect to market the future products largely in pulp wood. Of this, approximately 10,000 acres will be filed by paper mills and the balance by pulp wood operators. The Conservation Commission expects that 100,000 acres of land will be filed under the law before the end of the present fiscal year, and I believe that that figure is a very conservative one. It would therefore seem that the pulpwood operator is receptive to the forest crop law.

Its appeal to the lumber man is very much the same. The timber land owner who files his land under the Forest Crop Law will sell part of his harvest to the pulp mill and part of it to the saw mill and to the box factories. The soft wood would go largely to the pulp manufacturer, the hard wood to the box manufacturer and the saw mills. And the lumber man sells a large percentage of his soft wood production to the pulp and paper mills. This continuous steady market for his soft wood influences his attitude toward the Forest Crop Law very materially.



#### MODERN HYDROELECTRIC PLANTS

(Above) Head 30 feet, output 10,500 H.P. (Below) Head 85 feet, output 11,000 H.P. Allis-Chalmers equipment. Total water power developments in Wisconsin, counting one-half boundary streams and operating 50 per cent of time, amounts to 430,000 H.P. See note on page 61. Photos furnished by Northern Paper Mills and Wisconsin Public Service Corporation.



#### ARTIFICIAL WOOL, CELLUCOTTON AND RAYON

Products manufactured from wood cellulose; cellucotton and rayon are well known; artificial wool from wood pulp is now under development and may lead to enormous use in clothing such as suits and overcoats. Photograph furnished by Forest Products Laboratory, U. S. Forest Service.

The Forest Crop Law is in its infancy, having been passed by the last legislature, and it has been necessary to educate the timber land owner to what the Forest Crop Law means, before he was willing to consider filing his land under it. Pulpwood operators throughout the state are uncertain as to its requirements, and as to what will be expected of them if they make application to file lands. There is a considerable lack of knowledge on the part of a great many people, concerning what the law actually provides. One man I recently talked to, told me he had been advised by his attorney that the Wisconsin law was practically a duplicate of the Michigan law, and he had no use for the Michigan law. However, when I had explained to him the difference between the Wisconsin law and the Michigan law, he advised me that he would immediately file application for about 8,000 acres of land. The question most generally asked is, "What is the Conservation Commission going to require of me if I file my land under the Forest Crop Law?" If the Commission could and would make a public declaration in general terms of their interpretation of the words, "practice forestry" as set up in the law it would clarify this situation materially. If the timber land owner had assurance that the principal requirement would be an honest effort to keep out fires, supplemented by the planting of bare spots to fill out his stand, he would have a fairly comprehensive idea of what his cost was going to be before he filed his lands.

According to the technical foresters, it is possible to get a net return of \$1.00 to \$1.50 per acre per year from planting cutover and denuded lands. Assuming an investment of \$5.00 per acre in the land and the cost of planting, the returns are certainly remunerative enough to interest any owner of cutover land. Under the old *ad valorem* system of taxation, this was impossible. The Forestry Committee of the last legislature which framed this law, is to be congratulated and the forest using industries of the state of Wisconsin owe it a debt of gratitude which they should not be slow to acknowledge.

The owner of cutover or selectively logged lands who elects to put his land under the Forest Crop Law is justified in presupposing that the state of Wisconsin is going to give him adequate fire protection to protect its own interests. The state will be a partner to the extent of a 10% interest in the stumpage on these lands. Until recently, the state of Wisconsin has been lax in fire protection in its

timbered and cutover areas. The present Conservation Commission, however, has already fully equipped seven of the eleven fire protection districts, into which the northern part of the state has been divided, and in another year the other four districts will be added. I believe that the Commission is deserving of a great deal of praise. It has made more real constructive progress than had been made in the history of the state up to the time of its appointment.

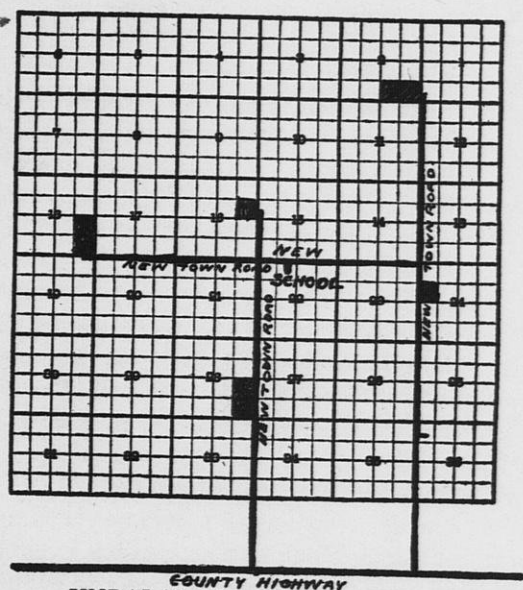
The Forest Crop Law is an equitable one, and fair to all parties concerned. No one benefits at the expense of another. It makes it possible for the owner of cutover lands to hold those lands for a future crop of timber at a cost which will show him a profit when the crop is harvested. The state receives 10% of the stumpage value of the crop when harvested, plus an income tax, and plus a possible estate tax. It would seem that the state is adequately protected.

The president of one of the paper mills stated to me recently that for successful operation, a paper mill needed three things: wood, water, and customers. The Forest Crop Law makes it possible for the state of Wisconsin to provide the wood to keep these mills in operation and retain within the borders of Wisconsin this great industry. The growing of trees on denuded and cutover lands will increase and insure the water supply for power by retarded runoff, decreased evaporation, and the prevention of erosion. It is, therefore, possible for the state of Wisconsin to give the paper mills two of the three things necessary for their continued operation, and under those conditions the paper mills should be able to provide the third necessary condition, the customers.

## ITS APPLICATION TO THE TOWNS

By R. B. GOODMAN

Supervisors and assessors are particularly concerned with the tax problems of their respective towns. This is especially true of the more thinly populated districts in forested and cutover regions of the northern counties. Expenditures for town roads and schools are the compelling items and to keep these items of the town budget within the procurable tax revenue requires careful figuring. In many of our northern towns the remaining mature forests, heretofore an increasing source of revenue, are being logged with consequent reduction of tax revenue. Cutover and burned over unsettled areas



## UNBALANCED TOWN BUDGET

A township of forest and wild land on which five new settlers have located farms (shown in black). These settlers created the following tax revenue and town expense for ten year period:

## REVENUE

Five farms, 320 acres (cleared land about 80 acres)

Assessed for land .....	\$3,200.00
Assessed for improvements .....	1,500.00
Assessed for personal property .....	500.00
Total assessed value .....	\$5,200.00
Tax rate 5 per cent; annual tax, \$260.00; for ten years	\$ 2,600.00

## EXPENSES

Construction fifteen miles of new town road .....	\$7,500.00
School for twenty pupils .....	1,000.00
Road maintenance \$30.00 per mile, or \$450.00 per year; for ten years .....	4,500.00
School operation ten years at \$300.00 .....	8,000.00
Total expense for ten years .....	\$21,000.00

Expense to town of five farms is over eight times tax revenue. In many cases farms so located are eventually abandoned.

and meagerly cleared homesteads have to bear an increased tax if the necessary roads are to be built and the rural schools maintained,

with the result that these cutover lands become tax delinquent and the less successful farms are abandoned.

To meet this situation by reducing the tax to land owners, who would practice forestry on their lands, and at the same time preserving substantially the present tax revenue to the towns is the purpose of the forestry crop law, and it is quite generally so accepted by the northern towns. The town officers realize that it is selective in its application. The land to be entered is published. The assessor is notified and a hearing is held in the locality by the Conservation Commission to ascertain all the facts and the town officers may appear. This selective application of the law makes it advisable for the towns themselves to know what parts of their area it would benefit the town as a whole to have entered and what parts of their area they advocate devoting to agricultural settlement. This can be learned only by considering also what portions of the town are better adapted to farm settlement than forestry.

This is not entirely a matter of topography and soil in detail, although average topography and soil conditions over a broad area must be considered; but the controlling factor is actual, successful and somewhat contiguous farm settlement. These settled areas of the towns have occurred through a process of natural selection based on both topography, soil and economic considerations, and these are the areas with the greatest development of roads and schools. There is in all of these towns available cheap land within these partly occupied areas. Additional farm ownership in these areas will tend to increase the assessed value of the town more than their presence will increase town expenditures. Whereas, indiscriminate new settlement on the undeveloped portions of the town creates a deficit in the budget. The accompanying diagram "Unbalanced Town Budget," illustrates this situation.

This is the situation which the intelligent administration of the Forest Crop Law will do much to alleviate from the standpoint of the towns, for fortunately the practice of forestry on extended areas involves neither the building of town roads nor schools. Practically the only town expense created is its share of fire prevention and suppression, and there is the further gain to the towns of the maintenance of industries which are dependent upon the forests, and the incidental, but perhaps equally profitable, recreational advantages.



## CHAPTER VII

# FOREST UTILIZATION IN WISCONSIN "CELLULOSE PROPAGATORS"

By HOWARD F. WEISS

This is a very changing world, especially is that realized by those who are engaged in business pursuits. An excellent paper along that line was published only a short time ago, entitled "Business has Wings," and I think that applies to the forestry movement just as fully as it applies to any other form of modern business activity.

In this forestry problem it is necessary for a good many of us to get quite a new viewpoint on the problem, at least on forest utilization, if we are to understand the problem of reforestation. We must get over the idea of viewing trees as containing simply so many logs. We must more closely adhere to the view of looking at the tree as a national product which develops a wood substance, or to put it in a more technical phrase, a plant which grows cellulose. If we will grasp it in that light, it makes the problem of reforestation take on a very optimistic hue, because looking at it in that light, it is very easy to conceive and to appreciate the possibility of creating out of the forest growth a great diversity of products and not only wood products; and this great diversity of products makes it possible to put the forest growth to a great many commercial usages. Some day we may change the forester's title to cellulose propagator!

It is not fair and it is not practical to expect all of the burden in this general problem of reforestation to be borne by lumber. Lumber cannot do it—lumber has got to be helped by more complete and economic utilization. If you don't believe that, talk to some of the men who are on the road trying to sell lumber in competition with other structural commodities, or talk to some of the lumber manufacturers who are trying to make a profit out of their operations. Lumber has enough of a load to carry now.

## APPLIED RESEARCH

By CARLILE P. WINSLOW

Forests are primarily but a means to an end. We want forests, not to *have* them, but to *use* them. To provide a merchantable forest is one side of the problem; to harvest it is the other. While we can have no harvest without a crop, there is no need for a crop unless we harvest. Thus forest growth and forest utilization are the Siamese twins of commercial forestry; try to separate them, and both will die. No companionate marriage is possible here; they are inseparably allied for all time.

This combination of crop and harvest—of growth and use—must result in at least reasonable profits on the expenditure of time, labor, and money if it is to survive. Commercial forestry, like every other commercial enterprise, must pay its way or ultimately disappear. Land and stumpage owners, either present or prospective, not only need to know or to estimate their production costs, but in addition must feel assured of a market for their crop at prices which return a profit.

The days of relatively cheap stumpage are either past or rapidly passing. Whether we like it or not, we face an increasing cost for our merchantable stumpage of the future. If we could merely add this increasing production cost to the sale price of the finished products, the utilization problem would be simplicity itself. Unfortunately, however, we are justified in assuming no such easy solution. While our production costs determine the price at which we can afford to sell, the price of competitive materials will determine the price we can get. Already this is a fact and not a fancy. Increasingly are uses long held by wood being contested by old materials that have been refined by science and by new materials of scientific origin, promoted in industry with the aid of extensive technical knowledge of their properties; metal lath and window sash, synthetic boards, all-metal automobile bodies, steel desks and spokeless wheels, concrete road bridges, asbestos and tile roofing, metal poles and posts, synthetic wood alcohol—these are but a few of the tendencies that are rife.

Here, then, is the situation in a nutshell: Rising costs of raw material on the one hand; competitive prices, both of substitute materials and of different species of wood themselves, on the other.

What is to be done about it? Two lines of attack lie before us: One is to retain, strengthen, and recapture former and current markets by providing always the right wood, under the right conditions, in the right place; the other is to create new values by the development of new markets and new commodities. Both require most vigorous attack; both are dependent for success on scientific research and its technical application.

Fortunately, the opportunities in both fields are more favorable than would appear on superficial consideration. In the first place, markets for forest products have been proving unprofitable or unsatisfactory at least in part because of improper selection of material, improper preparation for use, and improper design either of the finished commodity or the structure in which used, and not because the material lacks the intrinsic properties desired. In the second place, chiefly because of cheap raw material, the forest-using industries have found it profitable in the past to utilize only from one-third to one-half of the actual material grown or available on the stump. The remaining one-half to two-thirds, which costs as much to grow as the portion heretofore used, has been put to no economic use. This so-called waste material holds great potential possibilities for the production of commodities which can return an added profit to the production costs of stumpage.

If wood is to be assured of its rightful place in the front rank of dependable industrial materials of the future, its inherent properties must first of all be thoroughly known. Every wood has 30 or more distinct properties, such as bending and compression strength, hardness, toughness, resistance to splitting, resistance to decay and stains, nail-holding power, heat insulation, etc. All of these properties vary widely, not only between species and between trees, but even within a given tree. We must know these properties, and the extent of their variation; we must know how to segregate the material according to them, in order to insure uniformity of product and better values; we must know how to modify these properties by such methods or treatments as will increase durability and fire resistance, or dry without injury; we must know how to design structures to minimize conditions favorable to decay, to shrinkage, to swelling, to fire hazards, and the like; finally, we must know the critical requirements of each use so that it may be evaluated in terms of properties rather than of opinion and prejudice. Merely

to know how each property is proportionately distributed within a stand of timber should enable the owner to harvest it with a view to particular markets with much less waste than he can at present.

Hand in hand with the work on properties should go the development of selective tests so that the variability of natural-growth wood, which disregarded becomes a drawback in every use, can be converted into uniformity, which is an asset, greatly extending the uses for which wood may compete on a fair basis with other natural and artificial material of uniform quality. About the only selective test now applied to wood is the standard grading rules. These employ only the grader's judgment of outside appearance as a measure of the thirty odd inherent properties of a piece of lumber. It should be possible to devise a fairly simple test to segregate material for manufacture into siding and sheathing lumber which would make a warmer house than the siding and sheathing provided under the grading rules. Other reliable commercial tests are needed to measure and select for decay resistance, freedom from swelling and shrinking tendencies, toughness, resistance to abrasion, and many more properties in which wood exhibits a great variation. Aside from selective tests, science promises to provide many other ways of regulating the properties of wood so as to make it exactly suited for the purpose intended.

If the tendency of wood to absorb moisture could be cheaply controlled, the decay problem would disappear, and along with it the need for determining decay resistance and susceptibility to preservative treatment. Likewise, stability of wood under atmospheric changes would cease to be an important issue. Weathering would become a simpler problem to cope with. Gluing troubles would be reduced. Strength properties would no longer fluctuate in service. Insulating properties would remain constant.

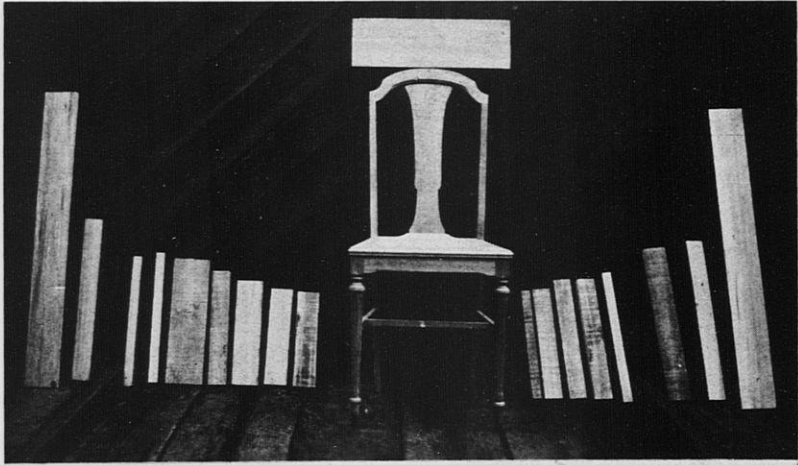
If density were controlled, as seems to be possible, during growth, then hardness, shock resistance, and other strength values would have a relative uniformity instead of their present excessive variability. Loss of quality in seasoning, which occurs to the extent of ten million dollars a year in one species of wood alone, appears for the most part preventable through applied research, with a gain rather than a sacrifice in speed over current kiln-drying and air-seasoning practice.

For a few uses the resistance of wood to decay is being in-



FOREST PRODUCTS LABORATORY, MADISON, WISCONSIN

Operated by U. S. Forest Service in co-operation with University of Wisconsin, a national institution, but performing much research of direct importance to Wisconsin forestry.



#### SMALL DIMENSION STOCK AND WOOD WASTE

A chair with the pieces of rough dimension that go to make it up. When these parts are cut from lumber about 40 per cent becomes waste. The fuel pile shown in the lower photograph obviously contains many clear pieces which could be used in the chair above. Photograph furnished by U. S. Forest Service.

creased, to degrees not yet accurately known, by impregnation with various preservatives. Meanwhile, unprotected wood in service is being lost through premature decay at a rate comparable in magnitude only with the destruction caused by forest fires. What is needed here is to develop an odorless, paintable, through and through treatment to increase decay resistance in building lumber. The fire resistance of wood may also be increased by chemical treatment. There is a great need for materials with which wood in building, furniture, and other products can be impregnated or coated to reduce the inflammability tendency and to suppress flames during burning.

The effective use of such information as above outlined requires knowledge of the critical requirement of each use for which wood seeks a market. Use requirements should be determined and made known in terms of wood properties. At present, only a certain few structural uses are held by wood by virtue of a precise definition or measure of the properties essential to the purpose. For the other hundreds of uses there are almost no specifications based on technical facts, or substantiated by scientific tests, and the material is chosen according to a wide variety of opinion and prejudice. Under such circumstances, whatever technical knowledge is obtained about the properties of wood is not as effective as it might be in bringing about better wood utilization, because the consumer has not evaluated his own needs in equally exact terms.

Past research in the design of wooden boxes and crates has been largely instrumental in bringing American containers and packing methods in foreign commerce from recognized inferiority to recognized superiority. In the same way the available data on wood properties should be applied to the fundamental design problems of other fabricate articles including house construction. Experimentation is needed to show home builders how to obtain maximum heat insulation in wooden house walls, floors, and roofs.

Another distinctive field bearing very directly upon waste elimination and cost reduction has to do with improved production processes. Take, for example, the inevitably increasing use of the "portable" or small sawmill with the contraction of timber stands which is throwing a large part of the lumber industry back a century or more in the development of its manufacturing technique. Private stumpage owners, as well as foresters, vitally need to know the rela-

tive production cost and value of lumber per M from trees of different diameters, what equipment is best suited to each type of cutting operation, how to obtain greater precision in sawing, how to reduce saw-kerf waste, how to increase the yield, and how to saw for grade. Seasoning losses are exceptionally high at the smaller mills, and it is important both to improve their air-seasoning practice and to adapt the dry kiln to their small-sized output.

As another example, take low grades of lumber. Under present practices, these do not pay their way. They are a perpetual problem, and bring poor prices because of the knots and other defects they contain. And yet much of this material, particularly of the hardwoods, is recut before final use into clear dimension stock. This clear material is intrinsically as good as the material in the more valuable grades. So also is the waste problem of short lengths being improved by the use of end-matched material for flooring and other purposes; and in the container field, research is showing how to efficiently use resawed, narrow, low-grade boards in lieu of veneer from high-grade logs.

But it is in the chemical and fibre field that most of the new uses for low-grade and waste material will probably be found. Tendencies in that direction are sufficiently striking for real encouragement. Everyone is doubtless familiar with the recent great development of viscose and artificial silk, but it is much less generally recognized that much of this is produced from wood pulp. It is also not generally known that artificial wool from wood pulp is now under development, and that success in that field may lead to an enormous use of such material in clothing such as suits and overcoats. In Wisconsin, the utilization of Jack pine is being solved, at least in part, by its manufacture at one large plant into a board and at another into a strong wrapping paper; and for Wisconsin hardwoods pulping processes are under development which give every promise of proving commercially successful. From hardwood waste in Tennessee, corrugating board for containers is now in successful production; from softwood waste in Mississippi, synthetic boards, both dense and light, are in successful production; and similarly in Minnesota a synthetic board from waste material, as well as a special insulating material, have also been commercially developed. These varied processes are entirely suitable for some of



Wisconsin's woods. Their development serves to indicate the tendencies and possibilities in the utilization of waste material.

One further phase of the problem requires particular attention. Opportunity for the control of wood properties begins in the forest. If adequate attention can be given in the future to the control of growth conditions, it will not be necessary to determine the properties of each succeeding crop of trees. This is even now a complication that must be dealt with, for the second-growth material that is now being marketed is different from virgin growth. Research has made a good start in associating the distinctive properties of certain woods with the conditions under which they grew, and this study should be carried out as fast as possible for all woods, for industry will soon have to take, or reject, what silviculture produces. To grow more wood is not enough. To grow high-density wood, low-density wood, straight-grained wood, trees with the correct taper for poles, wood without shakes, wood with few knots, decay-resistant wood, wood of low resin content, wood with high resin yield, wood without pitch pockets, wood easy to paint, easy pulping wood, and then to segregate the material to apply these properties effectively in the varied uses of wood—these are problems requiring an answer if the timber owner and grower of the future is to achieve his ultimate possible success.

## THE LIFE OF THE LUMBER INDUSTRY PROLONGED

By O. T. SWAN

The life of the lumber industry probably will be determined largely by other things than the more efficient utilization of wood. It will be determined chiefly by the economic background and lines of thought which are developed. Its life will be determined in no small measure by the results of research, which to the extent they develop new uses for waste wood products, have the same effect as increasing the present stand of timber.

Better Utilization, therefore, must refer not only to the use of lumber as a raw material, but must contemplate also land use, forest management, and efficient forest exploitation.

Efficiency must balance closer utilization against cost of securing that utilization. If the balance shows a money loss, there is a

waste of human effort. Accordingly, wood as a raw material must be thrown away constantly to conserve human energy. The dollar is the best scale by which to measure the dividing line between these two kinds of waste. The gain in useful material is limited by this measurement. By wasting sufficient human energy, it is possible to save and use nearly twice as much wood from the average acre as we now put into final use. But when the dollar balance is applied, the limit of saving in wood is very greatly reduced.

Wood in the standing tree is the cheapest raw material we have. As it stands, after 200 or 300 years, it rarely has a sale value of one dollar per ton of wood on the stump.

It will require skill to produce trees in commercial sizes at a dollar a ton. Better utilization will make it worth much more. It is necessary to recognize that the cheapest place where wood may be grown is not in the forest plantation, but on the side of the tree nearly large enough for harvesting—provided taxation is sound.

When commercial and economic research have explored these avenues, added life will have been granted the Wisconsin-Michigan industry. With material worth a dollar a ton, with labor at 35 cents to one dollar per hour, profitable utilization of parts ranging from porterhouse to dog meat is no small management problem. Virgin timber is usually selling for less than the cost of commercial replacement. That is the competition which forest management must meet.

Proper land classification will show that certain land is too poor for the economic growth of trees at present under any plan. It will show the lower margin of good land suited to agriculture. Between these two broad classes is the land claiming attention for forest management.

It must be recognized that these classifications are subject to change. As agricultural values and profits increase, poorer land can be used. Each advance in timber tax reform makes many additional acres potentially commercial forest land. Each step in more profitable utilization of the average tree has the same effect.

It should be recognized that forest land is also in need of classification. We need to know the rate of growth of each of the native species upon the different kinds of forest soil. We do know that there is a marked difference in tree values obtained within a given period on different soils. We need to know the increases in yield

which can be obtained through intensive forest management, as compared with natural growth. These things are basic steps towards better land utilization and the extension of the life of the lumber industry by reforestation.

There are wide opportunities to produce greater merchantable values when a new forest is being grown. The forester may select or work towards the most valuable species, and may determine the optimum time to harvest for certain uses. That is largely a problem of the future in this region, so far as saw log timber is concerned. For short rotation timber crops, such as pulpwood, it is an immediate problem. In timber of mixed age, it is difficult for the logger to determine the minimum size tree which may be taken at a profit. This size varies according to the market value of different species. There is necessarily the same lack of definite knowledge in determining the marginal log which may be taken at a profit. To the extent to which errors are made in leaving marginal products, there is an economic loss. Due to the studies of Zon and Garver, and the investigations of commercial foresters in this region, operators are assembling facts very useful in answering these questions.

We need a more accurate knowledge of the damage which running fires may do in green timber which is commonly considered to escape unharmed. Such damage is usually not direct fire damage, but that which follows where the bark has been sufficiently destroyed to permit the entrance of insects or decay. Preliminary studies indicate that damage of this kind develops slowly, that real losses are involved, and other things being equal, such timber should be harvested first. A few concerns have a mixed-age stand of timber of such character, that it is possible for them to secure appreciable increases in wood growth, and in values, by a system of deferred cuttings. These are a few of the things which are bringing about better utilization in the present forest. Progress being made along these lines by local lumbermen is in effect increasing the local timber supply.

The careful logger is keen to prevent waste by determining the most efficient log lengths, by cutting the logs as closely as feasible to standard lengths, and in taking measures to prevent deterioration of logs through staining and insect attack. Lumbermen of Wisconsin and Michigan endeavor to determine the dividing line be-

tween logs best suited for pulpwood, or lumber, or veneer, or sawn ties, and to determining the extent to which fuel wood, chemical wood and other by-products of the forests may profitably be recovered. Expertness in this is no small factor in good utilization. Statistics of yield of products by logs of different sizes and by trees of various sizes and species are making such classifications more efficient. The profitable saving of material and values through such methods differs widely in different operations, and to a large extent necessarily so, because at present there is not a market for all that might be produced under these several classifications. The tendency is distinctly towards the recovery of greater values and more material.

Probably the up-to-date American sawmill has gone nearly as far as is practically possible in converting logs into lumber without undue economic waste, unless the consumer changes many of his customs. The sawmill man has developed thin high-speed saws, has endeavored to work up slabs, has put his lumber into national standard sizes, and has worked out grades meeting the needs of the average consumer. There are, of course, many units in the industry which could use thinner saws, stick more closely to standard sizes, and standard grades and possibly develop markets for a part of their waste material. The operators, chiefly of small mills, which belong to no Association where these matters are canvassed, are the least progressive. The activities of associations constantly pave the way for advances along these lines.

Consumers' habits make waste. The consumer demands long boards in preference to short ones, standardized even lengths, which do not permit the saving which might be made if odd lengths were marketable, and has the all too common idea that the best grade should be specified, although other grades would be equally serviceable. It is common for the home buyer to require that No. 1 lumber be used throughout his building, although sound knotted lumber for sheathing, sub-floors, roof boards and other uses would be cheaper and equally as serviceable in that use. Mr. Holt has referred to the promotion of use of knotty lumber in interior finish. When the mills can manufacture and readily market short lengths, odd lengths, and end-matched lumber; when they may revise grades upon a new public understanding of usefulness, gains of 15 to 20% in the

conversion of the log will be possible,—and this is equivalent to a potential increase in the stand of timber.

The part which the consumer plays in determining utilization possibilities in the woods and in the mill, has been touched upon. There are in addition those increases in efficient use which give the consumer directly greater values in material or in length of service. By the use of wood preservatives, the railroads have doubled the average life of wooden cross ties, and have been enabled to use cheaper woods which naturally would have a short life. The application of this principle is possible in many forms of lumber use. The development of an efficient fire-proofing compound would be equivalent to growing many trees. Industrial consumers need accurate information showing the grades of lumber best adapted to their factory processes. Many firms have made such studies.

With 20,000 or more saw mills in all parts of the nation, some still operating under conditions which have grown up locally with respect to grading and standard size, it is inevitable that lumber reaches the great competitive markets, including this region, under various methods of grading and sizes which we do not consider best adapted for construction in this region. Mr. Collins will refer to American lumber standards in connection with sizes, species, grades and the grade marking of lumber with the Association brand.

Great waste can be avoided when lumber producers know what lumber items should be produced in different quantities, and the extent to which the mills of the United States are producing such items currently. For example, a certain lumber item will be in great demand for one or several seasons, but through some development in an important consuming industry may not be required the following year. Meanwhile, a heavy production of the item has taken place and at the same time, the items which should have been produced to meet these industrial changes are in short supply. Current methods of mature timber taxation force the heaviest lumber production which each mill believes it can market. The operator does not know the current limits and details of the market. With this lack of information showing current production of all the mills, and current requirements of consumers, there are considerable losses through over-production. There is also a lack of production in items which should have been made. It is apparent therefore, that great waste can be avoided by securing quick statistical information

covering the detailed requirements of the wood consuming industries, and the extent to which the saw mills of the country are meeting these detailed requirements. A weekly, statistical report, prepared under the direction of a committee of manufacturers and consumers to show just what is being produced and consumed, and the status of stocks on hand, together with the prospective requirements of the trade, would have a marked effect on better utilization of the forest. Over-production of this character leads to poor utilization of standing timber. Profitable saw mills can afford to utilize logs which an operation running at a loss must leave in the woods.

In the field covered by Mr. Winslow's address, we have the picture of the type of research which makes our present commercial products give better values and also the type of research which creates values in material now worthless. In that effort lies much of the possibility for a better return on the three without an increase in prices from the present commercial items—even for a better return with reduced prices—because such research aims to put values into material now worthless. Forest management and reforestation finds its incentive in the resulting increase in the value of the standing tree.

The future of the lumber industry in Wisconsin and Michigan, of reforestation and recreation facilities, will be determined in no small measure by the appreciation which the citizens of these states have for the timber products of their own state. Reforestation will take place soonest and prove most feasible in those states where a good local market exists for the present and future products of the forest. The day should be past when hemlock, birch and maple trees are cut to clear the way for school houses built of woods from other states. There are nearly two hundred mills operating in Wisconsin. They produce about twice as much lumber in a year as one large mill in Oregon. Our units will grow smaller and increase in number.

There is a new recognition of the relationship of the public to the local lumber industry. It is similar to the relationship to agriculture. State Administrative officers in Wisconsin and Michigan now specify home lumber for home projects, County agricultural agents explain the efficient use of Wisconsin-Michigan lumber, and lumber products. The great railroad systems have adopted the

policy of building up present and future industry by using Wisconsin-Michigan woods in this region. The retail lumber trade is giving impetus to the same constructive policy. The schools are teaching about Northern trees and will soon teach more about their uses—their part in the economic life of the state. It is for these reasons that the lumber manufacturers, consisting of the big and little mills of Wisconsin and Michigan, are spending considerable money each year to tell people about the timber products of your soil, and how they may best be utilized. For in the end, nothing but a profitable market for the tree, and appreciation of the home grown woods can, through reforestation, make the forest industries of this region permanent.

### IMPROVED MARKETING METHODS

By HAROLD C. COLLINS

Under the guidance of Secretary Herbert Hoover, the lumbermen of this country spent over four years in an effort to standardize their product. The major outcome was a definite standard size for lumber. It was determined and agreed to by most of the producing districts in the United States that two inch lumber, after being milled, was to be 1 $\frac{5}{8}$ " in thickness by certain fixed widths and that an inch piece of lumber was to be, after being milled, 25/32" in thickness by certain fixed width. As a result of this work while there was no law passed making it compulsory, the majority of the producing districts have complied with it, except for certain western mills that are still shipping into this section and elsewhere lumber which is less than standard in thickness. After determining the exact sizes of lumber, the lumbermen began thinking a little more about what their consumers or customers should know concerning their product and so they started the national trade extension movement, operating under the direction of the national lumber manufacturers association. For many years, as the population increased and the per capita consumption of lumber as well increased, lumbermen made money because of the natural enhancement in the value of their timber. Starting in 1909 this condition changed and when lumbermen investigated they found amazing reasons for their business becoming unprofitable.

A far seeing group of men, known to lumbermen as the substitute people, had, in a most inviting way, asked the public to use their products in preference to lumber. They had been so successful in their efforts that since 1909, while lumber production and consumption had declined 19.3% the production and use of substitute for lumber in construction had increased 194.4%. All substitutes for lumber sharply increased in consumption with the beginning of the building boom in the year 1919. The substitute people had been so successful that the per capita consumption of lumber while increasing each census year from 1820 to 1909, when it reached its peak of 484 feet, has from 1909 to 1925 declined to 316 feet.

The national trade extension program has only been in operation for about a year. It contemplates spending five million dollars over a period of five years in promoting the use of lumber. So far this campaign has dealt, primarily, with research and a large portion of the first year was taken up in analysing the claims of the substitute manufacturers. If the lumbermen are going to place before the consuming public the truth, it is necessary that they know the value of lumber as compared with its competing materials. Their research department has found that many of the claims of competing materials are not correct and that lumber, for many purposes is more economical and practical than even lumbermen themselves realized. One of the most potent arguments of our competitors, has been to tell the public that by using their products they are helping to keep the forests for future generations. The fallacy of this statement is that trees are a natural resource which can be replaced and that true conservation can be aided by buying lumber, for if the lumber which is now being produced cannot be sold at reasonable profit there is no incentive to grow more trees.

Actually more good lumber is being produced at this time than we have ever seen in the history of this country. The national lumber group will attempt to again make people "wood or lumber conscious" and show the consumer that there is no real substitute for lumber in its proper and rightful uses. Their agencies for carrying on their work have been the usual ones, namely a competent research department, experienced field men to carry the message to architects, contractors, consumers, and space advertising.

The Northern Hemlock and Hardwood Manufacturers Association, which is composed of the representative mills in Wisconsin



and Michigan, is, I believe, the earliest group to realize that it is necessary to keep continually telling the consumers the merits of the woods which they produce. In 1915 we started advertising beautiful birch and that campaign is still being carried on to convey to the public the merits of this great wood. It will be interesting to you to know that the states of Wisconsin and Michigan were producing in 1926, 74% of all the birch produced in the United States and, 60% of all of the birch produced in the United States and Canada. The results of our promotional work have been that the people now consider birch as one of the most beautiful of cabinet woods. They know that birch is one of the hardest, as well as ranking first in strength tests, among the commercial hardwoods. They know, further, it is especially suitable for interior trim and that a smaller piece of birch can be used than an ordinary wood without sacrificing permanency. It will not twist, warp, or check, and joints will not open. Its inherent beauty is recognized and it takes stains of practically all descriptions most readily. It is one of the few woods in which the heart wood as well as the sap wood takes stains equally as readily.

A short while after the birch campaign was inaugurated, we started the maple campaign. It is interesting to note that the states of Wisconsin and Michigan were producing in 1926, 60% of the total maple produced in the United States. Our message to the public on this wood is that it is one of the hardest woods known. It, therefore, makes an ideal floor. Its hardness and strength make it an exceptionally good wood for most any purpose. In addition, it has a soft, quiet beauty not comparable, of course, with the highly figured woods, such as walnut, but a figure of the type which, in the long run, is most pleasing to the eye. The recent color development is of great importance, not only to this wood, but for birch as well. This is a development in which we have produced a beautiful stain of such penetration that it is serviceable and useful on even as hard a wood as hard maple. You can now have (and the maple flooring association is telling the world this) a floor in any one of several colors. Your floor can be made in colors to harmonize with the balance of your room knowing that the wood on which this stain is placed is the hardest possible wood you could find for floors. You will see and hear more from now on of colored maple floors as well as colored woods for the entire interior of a home, including furni-

ture, radio cabinets, trim, etc. Maple and birch are the two woods on which these colored stains can most effectively be applied.

Our last and most successful campaign in this section was that in which we undertook to tell the public, in the states of Michigan and Wisconsin largely, of a wood which they had completely forgotten, namely hemlock. Many of you will smile when I mention the word hemlock because you who live in this state are under the impression it is an inferior building material. That is far from correct. For ordinary building purposes there is no better wood than hemlock in the size in which our northern producers are generally manufacturing it.

Granted that this wood is equal in merit to competing woods, then it is to the best interest of those who live in this state and adjoining states to use that wood. The hemlock mills have not only subscribed to the standardization program but they have come further than any other producing district, in that they manufacture their piece stuff an oversize or extra standard in thickness of  $1\frac{3}{4}$ " instead of standard size  $1\frac{5}{8}$ " giving to lumber substantially additional strength.

We trade-mark our lumber so that in purchasing it you have some way of knowing you are getting northern hemlock. This means that on each piece of hemlock lumber produced by our organization there is a symbol which identifies it to the consumer. Along with our trade-marking program, we originated, grade-marking to enable the buyer to distinguish between poor lumber and good lumber. The time will come, and it is not far distant, when all good lumber will be grade-marked and trade-marked. Our group would not have been so successful in this grade-marking, trade-marking movement without the co-operation of the retailers of the state. The architects and contractors are generally willing to do anything they can to increase the use of northern lumber and they have been most helpful.

The lumbermen may not have done all they could do or all they should do in the way of promoting the use of lumber in general or of increasing the demand for specific lumber, such as we produce in this section. They are, however, going further with this movement. The more promotional work which the lumbermen do the more valuable our forests become and, the more valuable our forests become, the more commercial forestry will be practiced.

## IN PULP AND PAPER MANUFACTURE

By ALLEN ABRAMS

Approximately 90% of the total material used for pulp and paper manufacture, is wood. It is therefore apparent that the more non-wood materials which can be used for such manufacture, the further the wood will go. For example, straw can be used for the manufacture of certain papers made previously from wood, extracted chestnut chips are now being used in Tennessee for making paper, sugar cane is being used for manufacture of insulating boards, the corn stalk is being developed for rayon cellulose to take the place of that now made from wood.

Approximately 10% of the annual cut of pulp wood is now being lost through decay, through improper piling and rotation of wood. One example which came to our attention was in the case of a company which was piling its pulp wood in one large conical pile. No attempt was made to rotate the pile, as a consequence of which the wood in the bottom lay for a period of six or seven years, at the end of which time it was so badly rotted that about 1,500 cords had to be thrown out. It is likewise true that pulp is often improperly piled and rotated and that usually no attempt is made to add disinfectants. The work of the Forest Products Laboratory has showed conclusively that pulp piling in rotating and with disinfectants will result in extremely low loss. Cases have come to our attention where piles of pulp have been so badly rotted that they were practically useless for the manufacture of paper.

In sections of the south, resinous stumps are being taken from the ground, chipped, extracted to remove the naval stores (such as rosin and turpentine) and attempts are now being made to pulp these chips. The recent remarkable development in the use of insulation or "underwear" for homes has resulted in a great development of insulating boards. This includes such well known boards as Insulite which is made from pulp screenings; Balsam Wool which is made from saw mill refuse; and Masonite which is made from saw mill waste by an explosion process. The last board is also made into a very hard board which is now being used in many places for wood and other structural materials.

Mills are now operating which make use of the refuse from saw mills and put out a good grade of pulp from such waste wood.

The fact that approximately 55% of the wood is now going to the sewer, in the case of sulphite pulp mills, has been a source of considerable anxiety to the pulp manufacturers. Recent research along this line indicates that it will be possible to recover and re-use this valuable wood material. It is not uncommon for many mills to be sending from five to ten percent of their pulp (and hence from 10 to 20 per cent of the wood) down the sewer in the form of white water. There has been a great deal of agitation along these lines recently so that mills are very much more careful than they used to be, particularly since it has proven to be highly profitable to recover this pulp.

The Forest Products Laboratory has, for a number of years, been working on the matter of increased yield per cord in pulp production. That they have been successful is proven by the fact that a number of mills are operating on these semi-pulping cooks. In some cases the yields have been raised from 50% to as high as 70%, although with some lowering in the quality of pulp produced. Research along the lines of better cooking has also been carried out and a new development in sulphite cooking indicates that increased yield can be obtained by this method. There is a distinct tendency today to re-pulp all possible waste paper. One case which comes to mind is that of a large container board mill situated near a city from which it draws daily 500 tons of waste paper and to which it furnished, 600 tons of paper board.

There were available in 1924 approximately the following stands of pulp wood in Wisconsin—Hemlock 6,400,000 cords, Aspen or poplar 2,000,000 cords, Jack pine 2,500,000 cords, Tamarack 700,000 cords, Spruce 550,000 cords, Fir 450,000.

It is very apparent that spruce, a highly prized wood, must gradually be supplanted by other woods some of which can be used as satisfactory and others of which may be developed to take the place of spruce. For example, in the manufacture of kraft, jack pine gives an excellent quality of pulp; at Cloquet, Minnesota, it has been established that woods such as aspen, birch and tamarack, which are little used species, can be worked up into good grades of pulp.

## IN DIMENSION STOCK

By JOHN V. QUINLAN

The making of lath from soft wood slabs and edgings is a standardized method for the utilization of that species of mill offal. It is of many years standing, both as to manufacturing machinery and methods, grades, and sale. It was to develop something in the same manner for the waste in Maple and Birch that the manufacture of Hdwd Dimension was undertaken by our company and to provide somewhat similar economies in manufacturing costs, the development of the McHale Multiple Guide Dimension Mill was prompted.

A tree grows round. The lumberman converts this material into boards, planks, timbers, etc., none of which are round. Therefore, in sawing the log must be squared, and this gives us slabs and edgings of varying degrees of intrinsic value, depending on the size and shape of the log, but nearly all from the outside portion of the log, therefore of quite uniform color, grain and entirely free from heart wood. This is inevitably lost in the slab pile, to be burned as fuel unless utilized in some fashion similar to this small dimension manufacture.

Some ten years ago, we began making 1x1-48" for broom handles out of Hard Maple, Birch, and Beech only, at a time when the market for  $\frac{5}{8}$ " and  $\frac{1}{2}$ " hardwood lath had collapsed. It was undertaken in an endeavor to make use of the spare time of the lathmill crew, who were idle when the mill was sawing hardwood, as much as to utilize the better quality slabs and edgings, and was carried on for several years, a Cinderella department, just as it has been in many other northern mills. However, it was apparent that quantities of material of the very highest intrinsic value were being lost because of being less than 48" long, and about this time we learned we could dispose of shorter lengths; in fact, that 42" was just as salable at 48", and that there was some demand for 28". Gradually our knowledge of possible outlets for stock of this nature was increased until our schedule of sizes included everything between a 1x1-12" up to 2x2-93". This was all run thru the regular lath mill rig.

In order to work up the stock most advantageously for these

various sizes, it was necessary to sort the stock for thickness, width, and occasionally for lengths, so as to avoid the necessity of constantly resetting our gang bolter in the lathmill, which cannot be done without suspending operations for the entire crew. Also, we learned it was impossible for a lathmill crew to handle all that could be saved in both lath and dimension stock and that some additional machinery was needed. We proceeded to look around for some such machine, discussed it with various machine builders, and learned there was nothing on the market even remotely similar to what we desired. At this juncture, our mill foreman, Mr. W. J. McHale, suggested, in tentative form, a design of machine embodying the requirements that were essential to the speedy and accurate working up of this material. We submitted his drawings and specifications to some of the better-known builders of sawmill machinery, with the result that we finally gave the order to the Prescott Company, of Menominee, Mich., and with some misgivings at that, as we found the price of this one machine must cover the cost of all of the engineering, drafting and pattern work involved in getting out a new model.

Very briefly, the machine consists of three gang bolters, and a rip saw with movable guide, set up side by side. We use one of these gang bolters on 4/4 thickness, one on 5/4, one on 6/4, and the movable guide rip saw can, of course, handle variable sizes up to 12" in width, and the machine will handle stock down to 12" long. One man can feed the stock as it comes to his hand into whichever setup is most apt to utilize that particular piece in the best manner, and one man can clear the machine, discarding the waste and pushing the dimension stock over toward the trimming table, where another man grades and trims to length; a fourth man racks it, bundles it, and carries out.

Shortly after this machine had been contracted for, the National Waste Elimination Contest was announced, and Mr. McHale asked our permission to enter this machine in the contest. It won first prize, and was considered by the judges a noteworthy contribution in the effort to more closely utilize the product of the tree.

A test run of two days, made under the supervision of representatives of the Forest Products Laboratory showed the following results:

Total volume of dimension stock mfg.....	3991 ft.
Total number of pcs. dimension stock mfg.....	15404 pcs.
Ave. contents per piece.....	.0259 ft.
Total production cost, \$28.49 per M ft. B. M.,	

which includes material, feeding, slasher saws, picking stock, bolting, trimming, bundling (including string) hauling out and piling in shed, carrying until dry, inspection and loading, and overhead. During these two days the mill cut 64,750 ft. of Birch and Maple lumber, the Dimension Stock recovered being 6.1% of log scale on that amount of lumber. On our production of 1927, volume recovered figured 4.5%, being 407,611 ft. of dimension on 9,018,112 ft. of Maple and Birch produced. A book on Chair Dimension Stock issued in 1924 by the Forest Products Laboratory was an incentive to us in the development of this closer utilization of sawmill waste, inasmuch as it demonstrated that a heavy percentage of their finished sizes are small enough to be procured from this sawmill waste.

From the start we have faced three great difficulties in the development of this department. First, the high cost of manufacture, which happily has been largely obviated by the McHale dimension mill; secondly, the deep rooted conviction on the part of buyers that they were buying only slabs and edgings and therefore should not pay lumber prices for the stock.

A third difficulty has been occasioned by the unsatisfactory experiences of many users of this dimension, who have received shipments that were poor in quality to begin with, not carefully manufactured or graded, improperly cured and carelessly loaded. Our own small dimension we describe as practically clear; it is graded and trimmed carefully in the mill, dried under cover, and again inspected at time of loading, and we have had but one complaint in a period of time covering four years, during which we shipped over 100 cars of this material.

It has been a slow and tedious process to learn what sizes were readily salable, and which ones were apt to become white elephants. We have, however, made satisfactory progress in this regard to such an extent that practically the only lengths still to be regarded as "orphans" as the 1x1-36", 1¼x1¼ 54", 1½x1½ 48" and 54". There are many consumers of lumber who can use this small dimension with profit, and who will no doubt turn to its use as its availability, reasonable price and high quality are demonstrated to them.

## IN NATIONAL TRADE EXTENSION

By FRANKLIN W. REED

The picture which I get from the preceding discussions is this: There are 18 million acres of forest lands in the State. Only two million acres carry merchantable sized sawtimber, which will support the State's lumber and paper industries at their present rate of production for about twelve years longer. Of the balance, four million acres are coming back to second growth sawtimber; seven million acres are so badly burned that they are not restocking; four million acres are restocked with cordwood species (jackpine and popple) which are making pulpwood at the rate of over three and one-half million cords a year. About 102,000 cords are being used. If the pulp and paper industry should change over from using spruce and hemlock and use jackpine and popple exclusively, it could still expand to something like three times its present size and not be over-cutting. Zon's growth figures, I presume, are based on the assumption of adequate fire protection.

At the same time the lumber industry in Wisconsin has ahead of it a period of serious contraction. It must taper off from a production of one billion down to about three hundred million board feet a year and can begin expanding again only as second growth crops can be developed to merchantable size. The absorbing question is: How fast can this be accomplished? In the Forest Crop Law Wisconsin has accomplished a most essential and promising piece of tax relief, and every possible effort is being made to bring forest owners to take advantage of it. The prospects, therefore, are excellent for rebuilding the forest resources of the State to the point, in a generation or so, where they will be able to support permanently a lumber industry of at least twice its present proportions.

The lumber industry has expressed its attitude through the National Lumber Manufacturers Association. It fully recognizes that practicable commercial reforestation is necessary to perpetuate the industry. The national and regional trade extension activities of the lumber industry,—quoting Wilson Compton, “aim at making the forest industries profitable, therefore forestry possible. In the language of Colonel Greeley, we say ‘Use wood and replace the forests’.” Interest in the possibilities of providing for future timber supplies has grown rapidly during recent years. Revision of



taxation laws in a number of states has removed a heavy burden from commercial forestry. Many operators are now systematically controlling cutting to prolong, if not perpetuate, their forests, and are protecting cut-over lands". The lumber industry has accepted a new responsibility to the public through its trade extension activities. The establishment of stable markets for the product of the sawmill carries with it the obligation to establish, where local conditions permit, an equally stable supply of sawlogs.

## CHAPTER VIII.

### HUMAN ASPECTS

#### A TABLE OF PRESIDENTS

The crowning feature of the conference was a banquet attended by 270 guests on Wednesday evening in the Fern Room of the Pfister Hotel. At a central table were seated the speakers and working members of the advisory and executive committees, and along the south side of the banquet hall on a raised platform were seated the banquet speakers which a Milwaukee newspaper called "A Table of Presidents". From East to West were seated, first L. F. Kneipp representing Secretary of Agriculture W. M. Jardine and Chief Forester R. Y. Stuart. Next to indicate still further the relation of agriculture to forestry sat Dean Russell. Then the presidents began: Fred W. Sargent, president of a railroad; Walter Kasten, president of a bank; Glenn Frank, president of a university; Oscar F. Stotzer, president of an association of commerce, and D. C. Everest, president of a pulp and paper association. Governor Fred R. Zimmerman and Mayor Daniel W. Hoan came next.

#### INTEREST IN THE CONFERENCE

The press made "news" of the conference to the extent of many columns of space before, during, and after the conference, and appreciative editorials were written. Many letters expressing interest in the conference were received by Senator Morris and Secretary Ashworth. At the banquet Harry J. Bell read a number of these messages including telegrams from Congressman George J. Schneider and J. B. Beck; Honore Mercier, Minister of Lands and Forestry of the Province of Quebec; J. P. Kinney, Chief Forester of the Indian Service of the Department of the Interior; and others. "President C. T. Jaffray of the Soo Line pledges his cooperation to Wisconsin forestry," said Mr. Bell. "He is represented here by Vice-President F. R. Newman. President Scandrett of the Milwaukee Road sends a similar message. He is represented here by T. W. Proctor of that railroad. There are many other letters and telegrams in the hands of the committee and nearly three hundred peo-

ple interested in this great subjected registered in the regular way at the meetings today."

### LIMITING THE TIME OF THE SPEAKERS

The conference program was printed with the time noted on the margin for each speaker, somewhat like a railroad time table, and the conference chairmen each took pride in holding his session to strict schedule time. At the banquet session the toastmaster waived the time limit, but Mr. Sargent said it reminded him of an experience:

"I was asked", he said, "to address the State Bar of Iowa at Fort Dodge. The chairman was Charlie Dutcher of Iowa City. Charlie said, 'Now, tonight, all of these speakers are to have all the time they want, the sky is the limit, but before introducing the first speaker, I want to tell a story. Down in Arkansas, not long ago, I went out to a farm, saw some hogs there; they were lean and lanky and I asked the farmer how old they were and he said six years. I said, 'My goodness, up in Iowa we raise hogs that size in six months!' The farmer thought it over and finally said, 'Well, what is time to a hog anyhow?' "

At the next day's session none of the speakers exceeded their time limit.

### PRESIDENT SARGENT ANSWERS MAYOR HOAN

"Milwaukee is peculiarly located", said Mayor Hoan, "very close to Chicago, a strong competitive center with I don't know how many railroads, Milwaukee with but two, growing at a faster rate than the City of Chicago. One of the reasons happens to be transportation by water. This community from the very earliest stages of its development has understood the importance of this great inland waterway, this inland ocean. We are the only city on the Great Lakes that has acquired virtually every inch of water front from one end of the city limits to the other for all the generations to come. One part of it we are building into a driveway and Layton Park, and the other is for commerce."

\* \* \*

"I don't think your Mayor should have been so hard on us", said President Sargent of the Chicago & Northwestern Ry. "He

made only one mistake that I recall and that was that he said Milwaukee was near Chicago. I know that upon reflection he would have said Chicago is near Milwaukee. As he told us how Lake Michigan had built Milwaukee, I wondered if railroads had had any part in that program. They probably paid the largest part of the taxes that bought Layton Park and will construct docks on Lake Michigan. In this connection I think of the difference in forms of transportation and I am reminded of the beautiful City of Cairo down at the meeting of the Ohio and Mississippi Rivers. How glorious are the cities of Cairo on the navigable streams of all the ages! So fortunately located, no wonder Cairo, Illinois, has outdistanced Milwaukee and all the cities that do not have complete inland navigation in the middle west! Cairo, having in all its history this marvelous unlimited navigation, outshipping all the cities that have to depend alone upon railroad transportation! Cairo, a magnificent city of twelve thousand people!"

Unfortunately Mayor Hoan had gone to attend a campaign meeting before this reply was made.

#### A MODEST TOASTMASTER

The banquet presented an essential part of the conference program. The speeches appear in the appropriate chapters of this book. Good fellowship, a flow of humor, and friendly banter enlivened the evening. On such occasions the toastmaster presides; quite frequently he monopolizes the spotlight. By his function of introducing each speaker he must himself make as many speeches as there are speakers to introduce and toastmasters have been known to occupy a good half of the record. Not so with Oscar F. Stotzer, the toastmaster of the evening—he was brief, and his introductions were apt and appreciative. He takes up only seven of the eighty-four pages of the banquet transcript—a record for modesty in toastmasters.

At the conclusion of Glenn Frank's eloquent and inspiring message, there was no anti-climax; Mr. Stotzer rose and said: "I am sure I express the opinion of every man and woman in this room when I voice our heartfelt appreciation of this wonderfully instructive, enjoyable and inspiring evening. I want to leave with you this parting thought:

So long as men shall be on earth,  
There will be deeds for us to do,  
Some way for us to show our worth;  
Each day shall bring the problem new  
And men shall dream of mightier deeds  
Than ever have been done before;  
The world shall always have the human needs  
For men to work and struggle for.

## THE FORESTS COME TO THE CONFERENCE

By K. L. HATCH AND F. G. WILSON

(NOTE: The exhibit displayed at the conference was prepared by the Wisconsin College of Agriculture and the U. S. Forest Products Laboratory. Mr. Hatch and Mr. Wilson were assisted by R. D. Garver, W. A. Rowlands, W. J. P. Aberg, and C. L. Harrington. The exhibit served to visualize the commercial forestry program, showing the green forests and their products converted to human requirements. It was the "thing itself."—THE EDITORS.)

"Whether awake or asleep—at work or at play—in sickness or health,—from youth to old age, man is eternally dependent on *wood*." The idea expressed in these words formed the central core around the exhibits that were on display at the Commercial Forestry Conference held in the Pfister Hotel.

A BIT OF "FOREST PRIMEVAL". As the visitor entered the exhibit hall, his attention was centered on a bit of Wisconsin's original forest inhabited by its wild life, even to the Indian wigwam. Bears roamed the woods which abounded in deer, foxes, badger, beavers, porcupine, and feathered wild life in their original home. This is essentially the "forest primeval".

RAVAGES OF FIRES. Then destructive man appeared on the scene with his wasteful cutting, followed by the desolation of destructive fire. Appalled by his own thoughtlessness he now tries to repair this damage and prevent its recurrence. This was shown by exhibits of forest tree seedlings and planting stock from the Trout Lake nursery now being used extensively for reforestation purposes.

FIRE CONTROL APPARATUS. Wisconsin now has over sixty fire control stations and lookout towers, used for quickly locating forest fires, and bringing fire control apparatus into play. One of these towers with its various instruments was shown as part of the exhibit. Accompanying it were the various kinds of fire control apparatus and forest fire fighting tools.

**OTHER INDUSTRIES DEPENDENT ON FOREST.** The extent to which other industries depend on forests was shown by various grades and types of paper. Containers for the products of other industries like baking, dairy, meat packing, boots and shoes, dry goods, poultry and eggs, and the like were on display. The modern use of color was shown in wood finishes for the builders' use.

**BY-PRODUCTS OF THE FOREST.** The U. S. Forest Products Laboratory had a complete exhibit of derived products of wood—like alcohol, acetone, pitch, tar, resin, turpentine, and the various wood distillates. The Forest Products Laboratory also tested the ability of visitors by a clever scheme for identifying Wisconsin woods, and for which the lucky winners were given prizes. "Do You Know Your Woods?"

**NEW USES FOR WOOD.** Do you know that you meet your woods even over a wooden breakfast table, while seated on a chair of wood? Sausage casings made of wood cover the sausage, served with the buckwheat pancakes made from flour delivered in a paper (wood) box. The coffee is poured from a pot with a wood (or bakelite) handle. The man of the house has his feet encased in stockings made of wood, while his good wife is comfortably clothed in wooden (rayon) underwear.

**MAN'S ETERNAL DEPENDENCE ON WOOD.** From his earliest youth to his feeble old age, man eternally finds delight in articles made of wood. The baby shakes his rattle and chews his teething ring—a little later he finds joy in his "kiddie car". From this he passes to skis and toboggan and base ball bats. Then manhood is upon him, and he must have a home with its furniture and equipment. Even his entertainment the "movie" show, the phonograph record, and the "talking picture"—is based on films and records made from wood (cellulose). In his later years he takes up bowling and golf and passes to his final end, seated in a comfortable wooden chair playing checkers with his neighbors, or smoking a quiet pipe. All these articles made of wood were appropriately placed in the exhibit. From the primeval forest to the final end, the exhibit was so arranged as to show *man's eternal dependence upon the products of the forest.*

## THE IMPORTANCE OF FORESTS TO SOCIAL WELFARE

By GLENN FRANK

There are, I think, five definite contributions that forests have to make, that the conservation movement has to make, toward the social welfare of the people of Wisconsin.

*First*, a reforestation movement will train the people of the state of Wisconsin in co-operative effort as no other single movement in the life of this state that I can think of can train them. All the forces of the State must come together if conservation is to move out of the stage of conversation.

*Second*, a reforestation movement will contribute to the social welfare of Wisconsin by stabilizing and diversifying the economic life of the state. It is obvious that if these now idle acres were covered with forests, and if we were really as far along as we should be in research in such fields as cellulose and colloid chemistry, not only would the lumber industry be much greater, but a hundred and one by-product industries would lend a new element of stability and would extend the diversity of the economic life of Wisconsin in an untold manner.

*Third*, the reforestation of our idle acres would be a very great sanitary asset, a health giving agent in the life of the State. Not only would the great forests of the future give rest to more tired brains, but it would insure our pure water supply, since pure water supply requires uninhabited forested water sheds. Southern France, before they planted pine forests, was a very unhealthy region. Since they have planted pines in southern France, that region has become a health resort. And in our own country, we have many examples of the sanitary contribution that forests have made. The planting of the eucalyptus trees transformed the sanitary conditions and health conditions around Rome.

*Fourth*, a reforestation movement will bring, in increasing measure to this state, the priceless boon of beauty. I have no hesitation in speaking of beauty at a commercial conference, because a commercial nation that forgets beauty will ultimately find the foundations of its commerce disintegrating.

A little while ago, I walked down the main street of a little village in Missouri and I saw, with a sense of pain, the barbarities of design that disgrace the average American small town. House

after house in that little village was so ugly that accident might have been its architect. I recalled, as I walked down the main street of the little Missouri village, the eloquent and exquisite beauty of the little French villages I had driven through the summer before, on the way from Paris to Chartres. I am sure there is just as much hunger for beauty in that little Missouri village as there was in any peasant community of medieval France, but somehow, in medieval France they built exquisite little cottages, while in the small towns of America, we run up galvanized iron shacks and call them shops.

A people cannot allow beauty to become the exclusive possession of antique dealers and bored millionaires, without sooner or later facing a reckoning. We do not want America to become the songless country that the Irish poet and dramatist, Lord Dunsany, tells about in one of his little imaginative tales.

"The poet came unto a great country, in which there were no songs", says Dunsany, "and he lamented gently for the nation that had not any little foolish songs to sing to itself at evening.

"And at last he said, 'I will make for them myself some songs so that they may be merry in the lanes and happy by the fireside.' And for some days he made for them aimless songs, such as maidens sing on the hills in the older, happier countries.

"Then he went to some of that nation as they sat weary with the work of the day and he said to them, 'I have made you some aimless songs out of the small, unreasonable legends that are somewhat akin to the winds in the vales of my childhood and you may care to sing them in your disconsolate evenings'.

"And they said to him, 'If you think we have time for that kind of nonsense nowadays, you cannot know much of the progress of modern commerce'.

"And then the poet wept, for he said, 'Alas, they are damned!'"

I give you this whimsical touch from Dunsany to emphasize the fact that beauty is not a thing that can be bought by a rich nation. You cannot forever go into antique shops and sponge off the sense of beauty your ancestors had. Beauty cannot be bought by a rich nation; beauty is something that is born in the soul of a radiant people!

Now, beauty is not just something to hang on the walls; beauty has a very intimate relation to the social content and social discontent of a commonwealth. I shall never forget a dramatic little in-



cident that happened just outside my apartment in New York several years ago. I had started out of the door of my apartment house for my office, when a garbage wagon turned the corner. The horses slowed down to an almost imperceptible walk. The driver turned in the seat, holding the reins with one hand and with a reverent carefulness lifted from one of the garbage cans, a half dozen almost fresh yellow tulips that were, I supposed, the discarded remainder of some brilliant dinner party the night before. I thought I could sense a glow on the garbage collector's face, as he laid four of these yellow tulips on the seat beside him and flung the other two to a hungry-eyed little girl who was watching him from the side walk.

Four men and a woman stopped to watch that little curb stone drama and I think it was worth watching. It had more to say to the people of New York than many of the plays that were playing to crowded houses on Broadway. Here was a man, who, in the midst of collecting garbage, loved beauty and shared it. As I watched that garbage collector, I found my faith in democracy—which I admit is a bit shaken now and then by the news—strengthened. The out-stretched arm of that garbage collector, reaching for yellow tulips, seemed to me that morning a symbol of mankind's universal hunger for beauty, and I felt that as long as there is something in men that will make them search for beauty, even in garbage cans, it is safe to assume that they can, if given a real chance, make democracy work, for I am certain that such men would rather reach for yellow tulips than for either the sword of war or the firebrand of social revolution. I thought, as I watched that garbage collector, that I saw how radicals are made in a democracy, and I framed in my mind a definition of a radical: A radical is a garbage collector who has never found yellow tulips in his cans.

Social unrest always finds its readiest recruits among men who have never been able to extract joy from their jobs or from their environment. It is an old observation that hungry men turn radical, but what we are likely to forget is that men with full stomachs may still be hungry with "a hunger not of the belly-kind that is banished with bacon and beans" but with a gnawing hunger for the things that make life free and adventurous and abundant. Maybe the statesmen have overlooked beauty as a campaign issue. For men do not revolt against a government that is making their work and

their lives and their environment beautiful. Beautiful homes, beautiful factories, beautiful offices, beautiful cities, beautiful landscapes, beautiful relations in business and industry. A community and state and national life that stimulate and satisfy men's hunger for beauty. These are the things that turn the energies of mankind from the ruin of revolt into the radiance of creative living. I suggest that beauty is better and cheaper than the big stick as an instrument for maintaining law and order and contentment and satisfaction. That a reforestation policy in the State of Wisconsin can make possible vast areas of beauty in which the soul of Wisconsin can continually renew itself is by no means its smallest contribution to the social welfare of the state.

*Fifth*, an intangible but very real contribution that forests can make to the social welfare of Wisconsin is this—the trees in the forest can be wonderful teachers for us in those moments when we fall into the habit of sticking out our tongues at each other and thinking that we have solved our public problems when we have called each other radicals and conservatives. There is nothing in the world that can teach us the real truth about radicalism and conservatism as a tree can teach us if we will let it.

I make that observation in the light of these vivid paragraphs from the Journal of Thoreau, the sage of Walden. He was meditating on some marvelous elms he had seen that morning and this is what he wrote in his Journal:

"They battle with the tempests of a century. See what scars they bear, what limbs they lost before we were born, yet these elms never adjourn. They steadily vote for their principles and send their roots further and wider from the same center. They die at their post, and they leave a tough butt for the choppers to exercise themselves about, and a stump which serves for their monument.

"They attend no caucus; they make no compromise; they use no policy. Their one principle is growth. They combine a true radicalism with a true conservatism. Their radicalism is not cutting away of roots, but an infinite multiplication and extension of their roots under all the surrounding institutions; they take a firmer hold on the earth in order that they may rise higher into the heavens.

"Their conservative heart wood, in which no sap longer flows, (I hope the conservatives won't take this to heart too much!) does not impoverish their growth, but is a firm column to support it, and

when their expanding trunks no longer require it, it utterly decays. Their conservatism is a dead but solid heart wood, which is the pivot and firm column of support to all of this growth, appropriating nothing to itself, but forever, by its support, assisting to extend the area of their radicalism. Half a century after they are dead at the core, they are still preserved by radical reforms. They do not, like men, from radicals turn into conservatives. Their conservative part dies out first, their radical and growing part survives."

I wonder if it is too much to hope that some day the American people may realize this highly intelligent relation between the spirit of conservatism and the spirit of radicalism inside the individual, inside the State, and inside the Nation—these two great forces of thought and progress, forever in conflict, but in the deeper sense, cooperative forces in the evolution of the American social order!

In this speech President Glenn Frank said: "We don't plant a tree — we merely preside at the mystery of their growth."

## CHAPTER IX

# FINDINGS OF THE CONFERENCE

## ITS SIGNIFICANCE

*By R. Y. STUART*

In reviewing the program of the conference I have been particularly impressed with the broad approach to the subject and the diversity of interests represented by those who participated in the discussions. This is highly significant. It evidences a widespread recognition in the State of the need for a sound solution, not only of its forest problem, but also of its general land problem. That need is both urgent and vital. It is a need that is shared by other States whose timber resources are comparable with those of Wisconsin. The broad representation of interests in the discussion of the forest problems not only indicated the general recognition of its importance and scope; it also holds out the prospect of effective action based on common counsel and coordinated participation in the effort, first to find the right answer and after that to bring to pass whatever the situation calls for.

There are both public and private agencies concerned, and public and private responsibilities to be recognized and assumed. The greatest value of the Wisconsin conference, as I see it, will result from getting these agencies together to work out how most effectively they may severally and jointly bring about better conditions. We need more such conferences which aim to focus public attention on the specific aspects of our forest problem and to present clear-cut programs of action following them.

If, as I anticipate, the Milwaukee conference becomes the means of developing understandingly the actual forest situation in Wisconsin and evolves a plan of action to improve it, the service rendered will be of importance, not only to the citizens of Wisconsin, but to the country at large.

## WHAT FORWARD STEPS HAVE BEEN DEVELOPED

By D. C. EVEREST

The fine attendance which we have had at this conference is ample evidence of the interest of people, in all lines of endeavor, in the perpetuation of the forests of this state. It is particularly gratifying to those who have been instrumental in arranging this conference.

For two days we have listened intently to a frank and common sense discussion of the various phases of the problem of Commercial Forestry. Out of this discussion has come some very definite suggestions as to what is necessary to make Commercial Forestry a success.

Perhaps the most important phase of the discussion has been that of the land situation. We have been told that only 25 per cent of our land area is productive. In other words, we are running to 25 per cent of production. Such a condition could not long continue in any industrial enterprise. We have also had the suggestion that before we can hope to carry on a forestry program in an intelligent way that we must have a land survey. We must take an inventory of our resources. We must classify our plant resources, which in this case is land and its present forest growth, and decide which parcels are best adopted for use in Agriculture, in Recreation pursuits, and in Forestry.

We have learned that this is a problem which cannot be solved quickly; that every group of lands, every individual ownership, every project which is to be considered as a potential Commercial Forestry reserve must be studied carefully and a program outlined for that particular set up. Individuals and corporations intending to carry on forestry as a business will do well to make haste slowly. This is not a business which has much background of experience. It means the employment of the best forestry talent in the solution of these individual problems applying to each ownership. The purpose for which the forest is to be maintained will be the deciding factor in what shall be done and how it shall be handled. It is a complex problem. Poorly advised use of certain lands, improperly outlined methods of handling timber crops or any of the thousand and one other errors which might be made in creating a commercial forestry project will react strongly against the success which we

hope to accomplish. One or two failures will do more to upset the constructive work we have started than any other thing could possibly do. We must get our foot on base, be sure that we have the best advice available on such projects as we contemplate, and then go ahead. It is probable that we will make mistakes, that some may become discouraged in their efforts, that some of the more timid owners may wait in their efforts until their neighbors have made a success. All of these things may tend to extend the time of accomplishment, but we will eventually succeed.

We have had encouraging reports from Zon on the growth of wood within the state. True, we are not growing the species of timber which we are now cutting, except to a slight degree, but we are growing some timber such as we have previously used and much of a kind which is not now used to any great extent. What then is the possibility of securing sustained yields of any particular class of timber in this state? I think that depends entirely on our ability to find out more about the growing timber. It all gets back to the fundamental basis of acquiring more knowledge of tree growth. Research, coupled with the education of the timber owner and the public through the dissemination of the results of such research, will prove the solution of the whole problem.

We have been told of what the forests mean to the public, but I do not believe that any one can visualize or express in words, the dependency of the public on forests. We have been told what the forest means to the lumber industry, to the pulp and paper industry, to the railroads, and to the public utilities. We have also been told of what it means to one of our newest industries, and I think we may well call it an "industry"—the recreational industry. The sportsman, the manufacturer, the retailer, the employees and the press have all indicated their interest in the perpetuation of our forest areas. Practically every interest in the state has expressed its need for the forest and forest products. We have again emphasized the fact that forests are our greatest necessity.

All of the eminent speakers who addressed us last evening clearly and forcefully pointed out the necessity of two basic features of a commercial forestry program; viz., fire protection and suppression and equitable forest taxation. We have a fine forest taxation law which will probably be amended as we learn more of the needs of our situation. The speakers also pointed out that in order to have



RAINBOW LAKE NEAR WAUPACA  
See "What Forests Mean to the Recreation Industry," Chapter III.



MANY LAKES LIKE THIS NEAR HAYWARD

This and the preceding photograph furnished by *Wisconsin Land of Lakes Magazine*.



adequate appropriations for fire protection and the cooperation of the public in making forests an insurable risk, which should be done, and to have an equitable system of taxation applying not only to the timber which we expect to grow, but what we have as merchantable stands at present; that we must, through a campaign of education, make the public forest-minded. We must make them realize the necessity of sustained yield of timber and all the other necessities of a forest program which have been pointed out in this conference. As President Frank has expressed it, "The public must become forest conscious."

What then is our program? First, it seems to me, we must have our inventory. The land survey and classification. Second, we must develop some form of organization or organizations to deal with the whole problem within the state. Third, we must immediately set up a campaign of education which I believe should begin with the public schools. We are assured of the cooperation of the state department of education and I believe that a textbook dealing with the subject of Trees and Forests should be carefully prepared and that a course involving the use of this book be established in the grade schools of the state. Ten years of that kind of education will insure a forest-minded citizenship for the future. It will arouse the interest of young men in the study of Forestry as a profession. The necessity for foresters is bound to increase and the natural course will be the establishment of a full-time course in Forestry as a part of the College of Agriculture, if not a College of Forestry.

We should endorse and support in every way possible the efforts of Dean Russell and the College of Agriculture in making the short course in Forestry, now established, a success. We must aid and support the work of the Junior Forest Rangers and other minor organizations. Their work is invaluable and will show quick results. We must enlist the support of the press, the Izaak Walton League, and other sportsmen' organizations, the service clubs, and every other agency which will lend publicity and serve to educate the public.

Fourth, we must take an interest in seeing that adequate financial support is given by the Federal government, to those agencies which will have so much to do with the solution of this problem of commercial forestry; viz., the Lake States Forest Experiment Station and the Forest Products Laboratory. Neither of these institu-

tions have ever had appropriations commensurate with the work they have in hand. The future may look brighter for these institutions in the way of appropriations as conferences of this sort are making Forestry a popular subject. Persons in political offices usually recognize the trend of public sentiment and it is not going to be so difficult to get appropriations for those agencies which deal with forestry and conservation in the future.

We should help in every way possible to secure passage of the McSweeney-McNary Forest Research Bill H. R. 6091 as that bill contemplates adequate provision for those things which will make forestry a reality rather than a mere hope. If this bill becomes a law, we may expect conservation instead of conversation. The Lake States Forest Experiment Station will be one of our greatest helps in determining forest policy. The selection of land and species, the drainage of swamp areas, selective cutting, in fact every item which is bound up in the problem of forest management will be the subject of research of the experiment station. The Forest Products Laboratory will continue to show us the way in the utilization of timber. The substitution of species is going to be one of our chief problems. In the pulp and paper industry particularly, I can see the possibility of a complete change in the raw materials used for making pulp. We have previously seen a complete change in basic raw materials for 90 per cent of the product within less than a 20-day period. While we use certain woods today I am certain that within a 10-year period we shall see almost as great a change in the kinds of material used as we saw during the transition from rags and straw to wood papers. We have learned from Zon of the changed conditions in timber growth, of a new species developing in abundance, and it is the utilization of these species through the research work of the Laboratory, coupled with the work of the interested companies which will assist materially in making Wisconsin a self-supporting timber state.

The Conservation Commission in its efforts to make commercial forestry possible, must have the active support of every one interested in this subject. We are fortunate in having a commission made up of men who are forest-minded. It means everything to us in accomplishing the results we desire to obtain.

Research and education are the foundation of any successful forestry program. Growing more and better, timber. Increasing the

value of a timber unit so we can afford to spend more per unit to grow more. This means research in fire protection and suppression, taxation, silviculture, utilization, substitution of species, forest management, and everything which has to do with the problem.

National programs will help much but what we need is to find out how to apply the information we receive to our local situation and develop further information. The pulp and paper industry has a highly developed technical process of manufacture, yet a process which works successfully in Maine or Louisiana may not work out the same way in Wisconsin. A different wood, or water, or any of a hundred other variable materials or conditions which affect our operating with such a process. What is here said applies with equal force to the conversion of all forest products, particularly that general group we call the lumber industry. This industry must apply national programs and general principles to local species of wood and it must adjust its methods from stump to consumer to meet the changing conditions, growing out of the application of research in forest management and utilization, as they develop in each individual operation. Forestry is as compellingly local as are the forests themselves.

We have, I believe, had the most successful conference of its kind ever held in this country, and I again wish to thank those who have made it possible. The proceedings of this conference together with all the excellent speeches should be briefed to present essential features and to avoid duplication and published under the editorship of R. B. Goodman, assisted by C. P. Winslow and Raphael Zon. I believe that through such a publication this conference will do more to bring the subject commercial forestry forcefully to the attention of the people of the state than anything we have ever done. I trust that we will be able to develop from this conference a satisfactory organization to deal with this subject and that in this work we may have the active support of every individual in Wisconsin in bringing about the one thing which will make possible the continuation of our timber supply, with all it means to the health, happiness, and prosperity of our state—Commercial Forestry.

## RECOMMENDATIONS OF THE CONFERENCE

GEO. W. BLANCHARD, *Chairman Resolution Committee*

**FORESTRY PLANTING:** In view of the fact that Wisconsin contains millions of acres of denuded and unprotected forest lands, and of lands covered with unsatisfactory growth, which lands will not contribute to the wealth of the state within any reasonable time unless planted to valuable forest trees, this Conference favors a large increase in the rate at which such lands are now being replanted. We urge a substantial increase in the State's facilities for the production of forest planting stock for use on both State and private lands, to the end that the existing Trout Lake Nursery may adequately meet the needs for planting in northern Wisconsin, and that a similar Nursery in the southern part of the State may supply the kinds of trees needed, and grow them under conditions suitable for their use in the southern part of the state. Planting by state and private agencies should approach as rapidly as possible the scale already reached by the states more advanced in forestry, namely, a matter of twenty or thirty thousand acres per year instead of the 1000 acres now being planted in Wisconsin.

**FIRE PREVENTION:** This conference heartily endorses the efforts of the Wisconsin Conservation Commission to extend its organized fire protection to all of the forest land in the state requiring such protection with a view to a complete field organization in the year 1928, and we commend the action of those owners of forest land who are cooperating in the protection of their property; to extend these activities this conference favors the increase of state appropriations for fire protection and suppression.

**FOREST RESEARCH:** The development of the forest resources of Wisconsin depends upon the accumulation of knowledge and the development of a technique bearing upon the reproduction, growth and utilization of forests, the methods of harvesting the crop and the adequate development of a complete program for forestry in all its phases. With these things in mind this conference endorses and commends the work of the Forest Products Laboratory at Madison, the Lake States Forest Experiment Station of the United States Forest Service, the College of Agriculture of the University of Wisconsin and the Wisconsin Conservation Commission. We favor the

extension of the activities of the experiment station within the state and commend the cooperative efforts of all of these agencies. We recommend to these several agencies that their work along research lines be more definitely unified and their activities correlated. We endorse the principles of the McSweeney-McNary Forest Research Bill. We endorse a national forest for the State of Wisconsin and urge upon the localities approved by the Federal government cooperation in the establishment of such forest.

**COUNTY FORESTS:** We recommend that county boards and other local agencies give careful study to reforestation with a view toward the solution of the idle land problem and we commend to all counties the plan for the development of county forestry programs, the acquiring of title to tax delinquent lands, and the prompt use of such lands for reforestation purposes.

**SCHOOL FORESTS:** In connection with educational development we heartily endorse the movement to develop school forests and instruction in tree planting and the care of forests in connection with our public schools and we especially commend the efforts now being made for the development of junior organizations for these purposes.

**LAND ECONOMY SURVEY:** We urge the continuation and completion of the plan of the land economic survey undertaken by the State Commissioner of Agriculture in cooperation with other state agencies and suggest that this work be extended, if possible, to the several counties of the state.

**COMMUNITY OF INTEREST:** We appeal to the press of the state to assist in the further development of public interest with reference to a sound and complete forestry program, and to the organizations interested in industrial activities of a state-wide character we suggest that special attention be given to the promotion of a forestry policy through the organization of special committees for this purpose.

**PERMANENT ORGANIZATION:** Wisconsin's first commercial forestry conference has aided very materially in crystallizing a public interest which indicates wide possibilities of successfully promoting commercial reforestation, and in view of the opinion of many who are interested in this movement that a permanent organization should be effected to keep alive and further promote the interest that has

been aroused, it is suggested that the Executive Committee of the conference be, and it is hereby authorized to formulate a plan for the creation of a permanent commercial forestry association for the state.

These resolutions and recommendations were drafted in this form that they might be carried back to all parts of the State of Wisconsin and be used by the people who are vitally concerned in the whole forestry program. One look into the future is worth just one hundred in the past and I say this, in connection with the whole movement, that its success depends entirely upon the forward looking citizenship of the State of Wisconsin and I have every confidence that we here assembled, together with those elsewhere in the State of Wisconsin, are big enough to make this program and plan not only a dream, but a reality.

# APPENDIX

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WISCONSIN FORESTRY LAWS

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VALUATION OF TIMBER CROPS

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GENERAL COMMITTEE AND PARTICIPANTS IN THE  
CONFERENCE





## WISCONSIN FORESTRY LAWS

**THE CONSERVATION COMMISSION LAW CHAPTER 29.09 (digest):** A commission is created, consisting of six men who "shall receive no pay for their services as members of the commission." They shall be persons having an interest in conservation, and shall be appointed for terms of six years, by and with the advice and consent of the Senate, three from the northern half of the state, and three from the southern half of the state. Four are required for a quorum to transact business. The Commission employs a conservation director to serve at a salary to be fixed by it, who must be a person "having executive ability and experience, special training and skill in conservation work" and is not subject to Civil Service. Such director is administrative head of the Conservation Department, but does not have authority to make rules and regulations.

The commission is given broad powers, including authority: To close seasons, to secure the perpetuation of any species of game or fish, to designate localities for refuges for fish and game, to acquire lands and waters for forestry purposes, state parks, public shooting grounds, fish hatcheries and game farms, nurseries and experimental stations; to capture, propagate and transport game or fish for stocking; to establish fire fighting systems and fire prevention systems, and to regulate camp fires and smoking in the woods in order to reduce forest fires; also to regulate the burning of rubbish, slashings and marshings, and to conduct research and disseminate information in conservation matters, and to co-operate with other departments and officials in such matters.

The Commission cannot vary any statute passed by the Legislature, with reference to seasons, penalties, or bag limits, except to further restrict, shorten or close a season. This form of organization has been tried in other states, and has been successful. It is founded upon the theory that conservation must have continuity of purpose and policy, and freedom from interference by political control or manipulation. The terms expire so that no Governor in any one term of office can appoint more than two commissioners.

**THE FOREST CROP LAW, CHAPTER 77.02-10 (Briefed): 77.02. (1)** The owner of any tract of land of not less than one hundred sixty acres may file a verified petition stating that he believes the lands are more useful for growing timber than for any other purpose, that he intends to practice forestry thereon.

(2) Upon the filing of such petition the commission shall set public hearing at not later than six months. Notice of such hearing and a description of the property requested to be approved as "Forest Crop Lands" shall be given to the owner of such land and to the assessor, by mail at least thirty days before the day of hearing and a copy of such notice shall be published at least thirty days before the hearing.

(3) After hearing all the evidence offered at such hearing and after making such independent investigation as it sees fit the commission shall make its findings of fact and make and enter an order accordingly. If it finds that the facts give reasonable assurance that a stand of merchantable timber will be developed on such lands within a reasonable time, and that such lands are then held permanently for the growing of timber, rather than for agricultural, mineral, recreational or other purposes, and that all persons holding encumbrances against such land have in writing agreed to the petition, the order entered shall grant the request of the petitioner on condition that all unpaid taxes against said lands be paid within thirty days thereafter. A copy of such order shall be forwarded to the state tax commission and to the clerk of each town and to the register of deeds of each county in which the lands are located.

(4) The commission shall determine whether there are on any such lands timber which has reached its full growth and is suitable for cutting; it shall not order such lands to be forest crop lands until the owner shall have cut and removed such timber. The provisions of this subsection shall not apply after January 1, 1935.

(5) The commission may hold hearings on petitions relating to lands in units of less than one hundred sixty acres when such smaller tracts are suitable for farm woodlots or where such smaller tracts are contiguous to a larger unit of forest crop land.

77.03. After the filing of the order the lands described shall be "Forest Crop Lands" on which taxes shall be payable as hereinafter provided. The passage of this act, petition by the owner, the making and filing of the order hereinbefore mentioned shall constitute a contract between the state and the owner, running with said lands, for a period of fifty years, unless terminated as hereinafter provided, with the privilege of renewal by mutual agreement whereby the state as an inducement to owners and prospective purchasers of forest crop lands to come under this chapter agrees that until terminated as hereinafter provided, no change in or repeal of this chapter shall apply to any land then accepted as forest crop lands, except as mutually agreed. If at the end of fifty years said contract is not renewed by mutual consent, the merchantable timber shall be estimated by an estimator jointly agreed upon and if they fail to agree, then an estimator shall be appointed by the judge of the circuit court of the district, whose estimate shall be final, and the 10 per cent severance tax paid on the stumpage thereon as agreed in the same manner as if said stumpage had been cut. The owners, excepting the owners of farm woodlots, by such contract consent that the public may hunt and fish on said lands, subject to such regulations as the conservation commission may from time to time prescribe.

77.04. (1) The clerk on making up the tax roll shall enter such land as "Forest Crop Land" or "F.C.L." Such lands shall not be assessed or tax levied thereon as provided in Chapter 70 of the statutes, but shall be subject to annual specific taxes as hereinafter provided.

(2) After the twentieth day of February the treasurer of each town shall certify to the state treasurer and also to the tax commission a list of the acreage upon which the owner has paid the taxes as hereinafter provided. A specific sum per acre as hereinafter provided shall then be paid by the state treasurer to such town treasurer.

77.05. Any owner shall pay to the town treasurer on or before February ten cents per acre on each description called the "acreage share," and on or before February 25 the state treasurer shall pay to each town treasurer the sum of ten cents on each acre so certified to him, provided, that if the total amount of payments so authorized in any one year shall exceed the appropriation for that year then the ten cents per acre shall be proportionately reduced. If such acreage share be not paid by February 20 to the town treasurer it shall be subject to a 2 per cent penalty plus 1 per cent per month until paid and if such land remain delinquent beyond the period of three years shall become the property of the state.

77.06. (1) No person shall cut merchantable wood products on any forest crop lands until thirty days after the owner has filed with the conservation commission and also with the tax commission a notice of intention to cut specifying the descriptions and estimated amount of wood products thereon, and with the tax commission, unless it shall find that because of the financial standing of the owner a bond may be waived, a bond approved by the tax commission for the payment to the state treasurer of the severance tax. Merchantable wood products include all wood products having commercial value other than products used by the owner for the maintenance or improvement of his premises, and fuel wood.

(2) During the month of July the conservation commission shall hold a public hearing and not later than September 1 thereafter shall make and file, open to public inspection, a determination of the reasonable stumpage values of the wood products usually grown in the several towns in which any forest crop lands lie. If there is a material variance in such stumpage values it may fix separate zones and determine such values for each zone.

(4) Before May 15 and November 15 succeeding any time in which any merchantable products were cut on any forest crop lands, the owner shall transmit to the conservation commission a written statement of the products so cut for the six months preceding the first day of that month, specifying the variety of wood, kind of product, and quantity of each variety as shown by the scale made on the ground as cut, skidded or loaded. If no such scale is made, an estimate thereof shall be made corrected by the first scale made in the due course of business and at once transmitted to the conservation commission. The conservation commission may accept such reports as sufficient evidence of the facts or may investigate and determine the quantity of each variety and kind of product so cut.

(5) The tax commission, upon certification by the conservation commission during January shall assess a severance tax on the right to cut and remove such wood products as were removed during the periods covered by

the preceding May and November reports, at the rate of 10 per cent of their value based upon the stumpage value then in force. Upon making such assessment, the tax commission shall certify same to the state treasurer and mail a duplicate by registered mail to the owner who made the report of cutting. The tax assessed shall become due and payable to the state treasurer on the last day of the next calendar month after mailing.

77.07. (1) The owner of the land shall be personally liable for any severance tax because of any wood products cut therefrom, which tax shall also be a lien on such wood products wherever situated and in whatever form, or if mingled with other products, then on the common mass, until paid, while in the possession of such owner or of any other person than a purchaser for value without notice in the usual course of business.

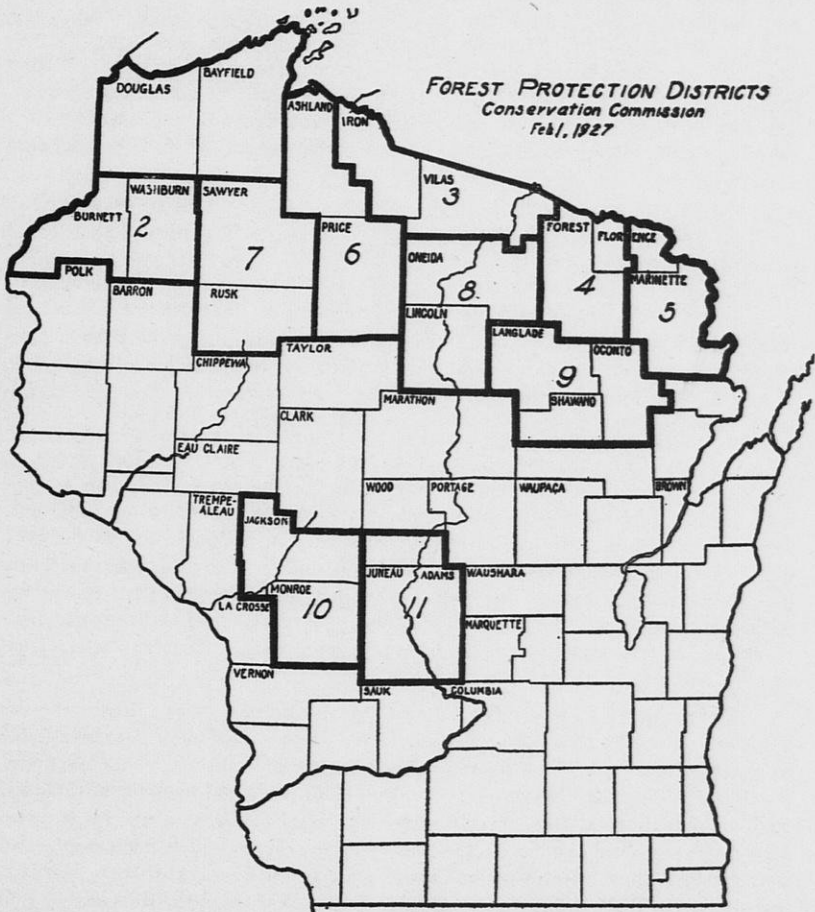
(2) If any severance tax remains unpaid thirty days after due, there shall be added a penalty of 10 per cent and such tax and penalty shall thereafter draw interest at the rate of 1 per cent per month until paid.

77.08. The conservation commission after due notice to the owner and opportunity to be heard, may determine whether the quantity of wood products cut did in fact substantially exceed the amount on which the severance tax was based, and if so shall so notify the tax commission, who shall assess a supplemental severance tax which shall have the same effect as the former severance tax, except it shall not be a lien on any property the title of which has passed to a purchaser for value without notice.

77.09. Any person who fails to report or shall intentionally make any false statement or report required by section 77.06 shall be guilty of a misdemeanor and punishable, on conviction, by imprisonment in the county jail for not exceeding one year or by fine not exceeding one thousand dollars, or both.

77.10. (1) The conservation commission shall once in five years, or on the application of the tax commission or the owner of any forest crop lands or the town board of the town in which said lands lie, cause an investigation and hearing as to whether any forest crop lands shall continue under this act. If on such hearing after due notice to the town and the owner, the conservation commission shall find that such lands are not meeting the requirements set forth in section 77.02, such lands shall cease to be forest crop lands. In case said withdrawal is by act of the conservation commission within five years from the date said land became forest crop lands the owners shall repay all moneys with interest at 5 per cent annum paid by the state as specified in subsection (2). In case the owner shall not repay said amounts within the time specified the land shall at the expiration of three years, become the property of the state. If at any time after five years the owner shall make use of the land for anything other than forestry, excepting grazing on farm woodlots, such acts shall constitute a withdrawal of lands, within the meaning of subsection (2) of this section and subject the owner to the tax and penalties therein provided.

(2) (a) Any owner of any forest crop lands may elect to withdraw all or any of such lands by filing with the conservation commission a declaration withdrawing any description and by paying to the state treasurer within ninety days the amount of all real estate tax that would ordinarily have been charged against such lands with simple interest at 5 per cent per annum less any



severance tax or acreage share paid to the state thereon, with interest at 5 per cent. The amount of such tax shall be determined by the tax commission after hearing and upon due notice to all parties interested. On receiving such payment the state treasurer shall certify that fact to the conservation commission. Such land shall then cease to be forest crop lands as of the date of payment to the state treasurer and the conservation commission shall certify that fact to the tax commission, clerk of the town, and the register of deeds

of the county in which such land lies. If such tax and penalties be not paid into the state treasury on or before the time specified the land shall at the expiration of three years become the property of the state.

**FIRE SUPPRESSION AND PREVENTION LAWS, CHAPTER 26.11-14 (digest):** The conservation commission shall have jurisdiction in preventing, detecting and suppressing forest fires and is authorized to organize and equip forest protection districts in charge of district forest rangers, and with the cooperation of county boards, emergency fire wardens may be deputized. Within these districts from snowfall to snowfall no fires may be set without permit. Outside of these districts the town chairmen are fire wardens authorized to pay fire fighters from town funds, and to forbid setting of fires during dangerous seasons.

Forest rangers, conservation wardens, town chairmen and emergency fire wardens must act promptly to put out forest fires and are authorized to order out men, teams and equipment to fight fires, and all able-bodied men so ordered are required to go under penalty of arrest. All fires set, including back fires, must be extinguished before leaving them. Locomotives must be equipped with serviceable spark arresting screens and in dry dangerous times track patrol must be maintained. All persons or companies are responsible for fires they set. Penalties are provided for violation of these forest fire laws varying from \$10.00 to \$500.00, or jail sentences.

**COUNTY REFORESTATION LAW, CHAPTER 59.98 (digest):** The people of any county at any general election may authorize the county board to acquire land for a forest reserve to grow timber, demonstrate forestry methods, protect watersheds, provide recreation, to sell trees and shrubs to residents of the county at cost, to establish wild life refuges, to regulate burning and prevent fires. Any county board maintaining a forest reserve shall co-operate with the conservation commission, and the county agent of such county shall carry on a reforestation educational program among farmers, other land owners and school children.

**TAXATION OF LANDS HELD BY COUNTIES, CHAPTER 75.32:** Real property upon which the county holds any certificate of tax sale shall continue liable to taxation and to sale for unpaid taxes, and the county shall be the exclusive purchaser at the sale; but when a tax deed shall be issued to the county and it shall hold tax certificates of sale unredeemed on the same property for two successive years subsequent to the date of the sale on which such deed shall issue, including certificates of sale made prior to the passage of these statutes, such property shall thereafter be exempt from taxation until the same is sold by the county. . . .

(Twenty-six counties had tax deeds and subsequent tax certificates aggregating \$3,043,000 on December 31, 1927, representing nearly 2,000,000 acres of land. Successful tree planting would develop a forest growth on much of this land that would enable the counties to sell to private owners for entry under the Forest Crop Law.)

## VALUATION OF TIMBER CROPS

The growing of timber as a business undertaking depends upon the expectation that the value of the crop when eventually harvested will repay the costs of planting, fire protection and taxes, and the interest accumulated on these costs, all carried forward on the young timber until it can be converted into cash, and, conversely, the value to be realized from the prospective harvest when reasonably certain is like a promissory note due at some future date which can be discounted to present value. The owner of land which should be planted to trees or on which there is a young growth of timber must study the problem of forest valuation. This is presented here in its simplest terms under the Forest Crop law. Forest valuation on lands entered under this law involves the determination of the following elements:

*n*—The number of years required for the seedlings, or the stand of young timber, to grow to a size large enough for harvesting. The rate of growth varies with the species of timber, the character of the soil, the climate, density of the stand, drainage, etc., and the merchantable size at which it is most profitable to harvest depends upon the market contemplated and the nature of the crop, whether pulpwood, posts, poles, ties or sawlogs.

*Y*—The ultimate value of "stumpage" harvested is the amount of the products in cords, pieces or M feet, multiplied by the unit value of these items prevailing in that locality for the species of timber, reduced by the deduction of the yield tax.

*E*—The capitalized cost, or the amount of money on which a given rate of interest would equal the annual charge for taxes and management. It may be considered that this is an amount of money tied up in the enterprise which is released when the timber is cut and for the use of which the owner must be reimbursed.

*S*—If the enterprise is on land having a market value, designate this value *S*.

*p*—The rate of interest that will induce the owner to undertake the investment.

*X*—The value of the land with trees planted on it, or of the young stand of growing timber at any particular time, that is, at *n* years before the net return of harvesting, *Y*, is realized.

Looking back over the above definitions, the value of timber

growth studies is apparent. There are many *plantings* in the Lake States region, the records of which give us fairly accurate information concerning the rate of growth of most of the suitable softwood species as well as some of the hardwoods. Joseph Kittredge, Jr., of the U. S. Forest Service, has prepared a bulletin on "Forest Planting in the Lake States" which assembles much information of this character. An actual examination of the young timber will enable the properly informed cruiser to determine with reasonable accuracy the time required for it to reach maturity and the yield that may be expected. What the future stumpage values will be the owner can determine in the light of past experience. He will naturally be conservative in his forecast, leaving an element of speculative profit in the possible increase in these values, and this speculative profit is an offset to the risks involved. Therefore, in many cases, a low rate of interest,  $p$ , has proved a satisfactory inducement for timber growing. The fourth factor in the calculation,  $E$ , has been the stumbling block in the way of making any reasonable forecast of timber growing costs as the annual tax on the timber not only increases with the growth of the timber, but with arbitrary increases in its assessed value. This difficulty is removed by the Forest Crop Law which fixes the annual tax at 10 cents per acre for the entire growth period. It is now also possible to estimate the annual cost of the care of the timber crop while growing, including co-operation with the State fire control and suppression program.

Our problem in timber valuation is to find the present value,  $X$ , of the growing timber crop that must wait  $n$  years for harvesting, and that will net  $Y$  dollars when harvested, requiring  $E$  dollars to be put at  $p$  interest to pay annual carrying charges for the  $n$  years. Evidently the present value of  $X$  is the future value,  $Y$ , discounted at compound interest for  $n$  years, but as the items  $E$  and  $S$  are released when the timber is cut, they must be added to  $Y$  and discounted to the present time also. That is, we have

*Formula (a)*

$$X \text{ (present value)} = \frac{Y + E + S}{(1 + p)^n} - E$$

**EXAMPLE:** Assume a stand of young timber will be ready to harvest in 20 years; that it will average 10 M feet per acre when cut, and that the stumpage value will be \$10 per M feet, or \$100



per acre. Deduct 10 per cent yield tax. Then  $Y$  equals \$90. Assume bare land value,  $S$ , is \$1.00 per acre.  $p$  is assumed at 5 per cent, the annual tax 10 cents per acre and the annual management charge 10 cents per acre, making a total of 20 cents, then  $E$  capitalized at 5 per cent amounts to \$4.00 per acre. Substituting these figures in the *Formula (a)*, we have:

$$X = \frac{90 + 4 + 1}{1.05^{20}} - 4$$

The value of  $1.05^{20}$  can be obtained from compound interest tables. Professor H. H. Chapman's "Forest Valuation"\* contains such tables.  $1.05^{20}$  is 2.65.

$$X = (95 \div 2.65) - 4 = \$31.85 \text{ per acre.}$$

If we use this formula to determine what an acre of planted timber is worth at the time of planting, we have a commercially accurate method of determining the value of land planted to a given timber crop, and this also offers a reasonably accurate guide as to the amount that the land owner can afford to expend in tree planting ( $P$ ). This may be expressed:

*Formula (b)*

$$S \text{ (land value per acre)} = X - P \text{ (at time of planting),}$$

$$\text{or, } P = X - S$$

EXAMPLE: Assume that a given area to be planted costs \$2.50 per acre. How much can be expended in planting with pulp species that will mature for cutting in 40 years with an average growth of  $\frac{1}{2}$  cord per acre a year, or yield of 20 cords and stumpage value of \$5.00 a cord, with the same carrying charges as in the previous example? We then have

$$X = \frac{Y + E + S}{(1 + p)^n} - E$$

$$X = \frac{90 + 4 + 2.50}{7.04} - 4 = 13.70 - 4 = \$9.70 \text{ per acre}$$

$$P \text{ (Allowable planting cost)} = X - S$$

$$P = 9.70 - 2.50 = \$7.20 \text{ per acre}$$

The editors referred these calculations to F. W. Reed and W. N. Sparhawk, foresters having experience in forest valuation, who endorsed the *Formulas (a)* and *(b)* as sufficiently practical for forest valuation on low priced land for planting operations, or as a basis

\* John Wiley and Sons, New York.

for buying and selling young timber stands. These formulas understate present values by failing to take into account that with the right harvesting, not only would it be unnecessary to plant over again, but the next period of  $n$  years would be materially shortened, thus creating added future land value. These scientific refinements require intricate formulas, and however the reader may feel about going further, the editors respectfully decline.

## PRESENT VALUE OF YOUNG TIMBER

*Formula (a)* using 10 cent annual tax; 10 cent annual management expense; and 5 per cent compound interest. ( $E = \$4.00$ ). Value of land alone is \$1.00 per a.

X, Value of land and timber per acre $n$ years before harvesting					Y, Net Value of future crop less yield tax
50 yrs.	40 yrs.	30 yrs.	20 yrs.	10 yrs.	
\$5.15	\$10.91	\$20.30	\$35.59	\$60.47	\$100.00
4.28	9.49	17.98	31.81	54.33	90.00
3.41	8.07	15.67	28.04	48.19	80.00
2.54	6.65	13.36	24.27	42.05	70.00
	5.23	11.04	20.50	35.91	60.00
	3.81	8.73	16.73	29.77	50.00
		6.41	12.96	23.63	40.00
		4.10	9.19	17.49	30.00

From the above table it would appear that on the basis of 5 per cent compound interest there would be little inducement to plant a timber crop that would require more than fifty years to reach maturity.

Mr. Kittredge, in "Forest Planting in the Lake States," presents the following estimate of the time required for planted trees to produce merchantable crops:

Species	Time for products desired	
	Posts, fuel & pulpwood 6" to 8" trees.	Ties, poles, & saw-logs. 12" to 14" trees.
	Years	Years
Eastern Cottonwood.....	20- 30	35- 50
Jack Pine.....	25- 45	60- 90
European Larch.....	30- 35	50- 60
Norway Pine.....	40- 50	60- 90

White Pine.....	40- 50	60 -90
White Ash.....	50- 60	80-100
Basswood .....	45- 60	80-100
Red Oak.....	50- 60	80-100
White Spruce.....	60- 80	100-140
Sugar Maple.....	70- 90	110-150
Northern White Cedar.....	90-140	160-220

The variation in the number of years shown above represents differences in soil conditions, degree of management, and competition with natural reproduction of aspen, pin cherry and scrub oak.

It should not be inferred, however, that the commercially practicable forest crop may not include species and produce trees suitable for saw-timber. The discussion of valuation here given has been reduced to its simplest terms. Actual planting and actual stands of young timber do not always cover an entire area with even aged trees. Both may occur where there is a percentage of natural reproduction of varying ages. Nor are all the even aged trees of the same size. The rate of growth of trees of the same species varies with the seeds themselves as well as accidental conditions of soil and environment, and the plantings or the young timber stand may be of mixed species.

By the time the plantings and adjacent natural reproduction reach merchantable size, there will be many sizes of trees in the stand, and, while *S*, or the net yield per acre, may be realizable, it may be more profitable not to harvest the entire crop, but to cut selectively, leaving some trees to grow into sawlog size while the trees left below profitable cutting limits are growing to merchantable size.

Not only are the problems of valuation involved complex, but they are of little practical value, as any attempt to estimate the future values involved would include too many possibilities of error. The preceding pages of *Forestry in Wisconsin* indicate that changes in methods of utilization of wood are constantly developing and future utilizations must necessarily govern the treatment of the growing timber crop in the years to come—lumber may be produced from wood (as paper is now) instead of from sawlogs. On the other hand there may be a high premium on older larger trees that will alter the annual growth in volume, i.e., 3 per cent compound interest, to a growth in value of more than 5 per cent compound interest.

The use of compound interest seriously affects discounting future values to the present time. However, only a small revenue at rotating periods from thinning the crop will meet the interest charges and do away with the necessity of compounding.

What about the risks involved in the forest crop? With adequate state wide forest fire protection, the risks are summarized by Kittredge as follows: *Animals*—mice, rabbits, deer, cattle, etc.; *Insects*—pine weevil, spruce gall, bud worm, grasshopper, beetle, etc.; *Fungi*—white pine blister rust and jack pine stem rust; *Poor seed and careless planting*—; *Competition* of natural tree growth, brush and grass; *Weather*—drought, freezing, sleet; “all of which, combined, has resulted in losses of from 10 per cent to 50 per cent of the trees,” and where modern methods are employed, 6' x 6' to 8' x 8' planting will insure a survival that will produce a successful plantation.

## GENERAL COMMITTEE AND PARTICIPANTS IN THE CONFERENCE

\* Indicates members of General Committee. D. C. Everest was General Chairman and R. B. Goodman, Chairman of Executive Committee.

° Indicates participants in program who were not present at the conference.

- \*Aberg, W. J. P., Pres., Wis. Division, Izaak Walton League, Madison, Wis.
- Abrams, Allen, Tech. Dir., Marathon Paper Mills Co., Rothschild, Wis.
- °Alexander, J. E., Gen. Mgr., Nekoosa-Edwards Paper Co., Port Edwards, Wis.
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- \*Babb, Max W., Vice-Pres., Allis-Chalmers Co., Milwaukee, Wis.
- Banzhaf, George, of Banzhaf & Watson, Consulting For., Milwaukee, Wis.
- \*Bell, Harry J., Exec. Direc., Milwaukee Asso. of Commerce, Milwaukee, Wis.
- \*Bissell, F. K., Pres., Bissell Lumber Co., Ladysmith, Wis.
- \*Blanchard, George W., State Senator, Edgerton, Wis.
- \*Brookings, W. DuB., Mgr. Nat. Res. Prod. Dept., U. S. Cham. Com., Washington, D.C.
- \*Broughton, C E., Editor, Sheboygan Press, Sheboygan, Wis.
- Cecil, C. L., Forester, Cornell Wood Products Co., Duluth, Minn.
- Collins, Harold, Asst. Sec'y, C. C. Collins Lbr. Co., Rhinelander, Wis.
- Coit, Merrill, Sec'y, Baker, Fentress & Co., Chicago, Ill.
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- \*Duffy, Walter A., State Commissioner of Agriculture, Madison, Wis.
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- Foll, Carl, Timber Lot Owner, Deerfield, Wis.
- Frank, Glenn, President, University of Wisconsin, Madison, Wis.
- Frank, M. H., Mgr., Wisconsin Power & Light Co., Fond du Lac, Wis.
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