



Mr. E. Stewart, President of the Canadian Forestry Association

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NEW BRUNSWICK FORESTRY CONVENTION

FREDERICTON, N.B., 20th and 21st February, 1907.*

Though the attendance at the convention was not as large as was expected, the leading lumbermen of the Province were present and these with the members of the legislature and the speakers made a very representative gathering. The convention was opened by Governor Snowball, who after speaking briefly, called upon Premier Tweedie.

The premier after welcoming those present, explained the object of the gathering. Legislation had been passed at the last session toward bringing about such a gathering as the present one, as it was thought that the question of forestry protection and its interests were of the highest importance. On this account the government had selected the best experts on the subject that they could obtain. The speeches at the present gathering would be brief but to the point, as it was desirable that the fullest discussion be given to all subjects. The premier concluded his address with a paper on the history of lumbering in the province. The growth of the exports from the various ports during the past one hundred years were shown. Spruce, which in early times was regarded with little interest, was now our leading export. The province owned 100,000 square miles of timber, and the revenue last year reached \$250,000, besides game licenses, etc. The premier pointed out how it was of the greatest importance that such a valuable asset should be protected and everything possible done to promote its interest.

* This synopsis of the proceedings of the convention has been compiled from the excellent report published in the St. John News.

J. D. Hazen, M.P.P., leader of the opposition, made an eloquent address joining with the premier in extending a welcome. He regarded the meeting as one of much importance to the province. Every great interest now met to discuss the questions of the day, and though in this province other interests had met, this was the first time that the greatest of all the industries had been considered in convention. This was perhaps natural as in former times the people thought more of destroying the forest in the interest of farming. But the time had come now when protection and preservation were necessary and that all should combine together towards this end. One of the greatest enemies of the forest was the forest fire and the greatest necessity was to guard against this. Mr. Hazen pointed out the great value the crown lands were to the province. It possessed over six million acres of lands.

Hon. A. R. McClelan, ex-lieutenant governor, read a short paper on forestry, which he had prepared at the request of the premier. He thought if the right of the eminent domain had been applied to this province fifty years ago that the province would be much better off today. He was glad to note that great progress was being made throughout Canada and the United States along the lines of forestry preservation. He also made reference to the great importance attached to the lumber trade by some of the countries of Europe, and of the rapid growth of the pulp and paper industry. He spoke of what was being done in Japan and Germany in preservation. Mr. McClelan thought in the way of forest culture and forests if the surveyor personally owned the crown lands of the province it would be safe to say that he would not destroy it for the sake of large immediate profit, but would protect and foster it for the sake of his children and others.

He advocated a course of study in all the schools that would familiarize pupils with tree culture and its importance to the country. Much has been heard of our great western heritage. But here in New Brunswick we have a heritage that probably has no superior on the face of God's earth.

Elihu Stewart of Ottawa, president of the Canadian Forestry Convention, was the next speaker. In all parts of the country he was pleased to note a general awakening of the people in the direction of forest preservation. Evaporation, transportation of vapor and condensation were factors in the life of the forest which were provided by nature. The soil of the forest continually fertilized as it were, by the moisture of the air and drying leaves, regenerating itself. All that nature asked was that man should not interfere with her methods. The preservation of the forest was a necessity for the continuous supply of water.

It was only in recent years that any uneasiness had begun to be felt in this matter. It was thought the large and increasing use of iron and stone for building and other purposes would result in less wood being needed, but this had turned out not to be the case. The manufacture of pulp and cellulose was taking a lot of our best trees, and it was certain that there would be a great scarcity of wood in the near future unless it was at once carefully husbanded. The increase in the local exports this past year was five and one half millions more than the previous year.

The necessity for further supplies of lumber arises from the enormously increasing population. He was no alarmist, but these exports of timber were increasing largely and even the United States say that their future hope is Canada. Unless the several governments of the Dominion soon awake to the fact that they have been unwise and improvident in the past and do something to stay the tide of destruction which had been going on for so long, there would soon not be enough to supply their own needs, without taking the question of exportation into account at all.

In the course of his address, Mr. Stewart made the following recommendation as an amendment to the Public Domain Act.

“In future, patents of timber lands should contain a provision that at least ten per cent. of the territory conveyed should be left in forest, but remain the property of the owner, and be cut only under the direction of the government, and so as not to interfere with forest preservation.

AFTERNOON SESSION.

At the opening of the afternoon session of the convention Premier Tweedie said that before the regular programme was taken up the subjects which had been dealt with in the morning might well be discussed by those present.

Attorney-General Pugsley thought that some most valuable suggestions had been thrown out. The papers read by ex-Governor McClelan and Mr. Stewart, all must agree, gave us the greatest information. He could see how from the government standpoint legislation could be enacted in respect to preserving the crown lands, but the difficulty came with making legislation in regard to lands granted to private persons and who were now the owners.

In Kings county the lands were almost all granted in this way in the Sussex valley. He remembered as a boy a beautiful stream where he fished. Today that stream was nothing but

gravel. He would like to ask Dr. Stewart if he could give any information as regards the protection of the forests in this respect.

Mr. Stewart said that he could not very well give an opinion off-hand, as he was somewhat taken by surprise and the question was a most important one. Mr. Stewart, however, thought that the public interest was paramount. If private owners cannot be induced to protect the forests then expropriation might be ordered. If the cutting of trees destroyed the water supply then there could be no question of the legislature having the right to interfere.

Legislation might be made holding out inducement for private owners to retain forests and the protection of trees. The subject was an important one and worthy of the greatest consideration.

Mr. Geo. U. Hay of St. John spoke of the great benefit to be derived from the calling of such a convention.

Chancellor Jones of the University spoke on the subject of the attitude of educational institutions toward forestry. He thought that as far as the educational interest was concerned its regard with forestry was of much importance, and that the public schools along certain lines should do all they can to support forestry. One of the most important was the subject of revenue, as it would stimulate the pupils. Then the pupils should be led to appreciate and understand the forest products and the necessity of these products for holding up our country. Then forest protection. Children should be taught various items under this head. How it is necessary to protect our forests to preserve our streams. The chancellor thought that this latter might form many interesting and important lessons. He remembered himself as a boy where he fished in a stream that was now filled up on account of cutting away the woods. Then there is the subject of protection from wind and from snow. They all form a most important subject to instill into the young men. Dr. Jones spoke of the beauty of our forests and maintained that outside of this the protection to our game and fishery should ever be uppermost in our mind.

The institutions of higher learning may deal with the subject. He thought that with a professor at the University a course in forestry may be established equal to any on the continent. With an additional professor the course should be made most complete. As a course, he would outline: 1st year, English, mathematics, modern language, surveying; second year, botany, physics, drawing, advanced surveying; third year, chemistry, economics, theory of earth pressure, retaining walls, foundation walls, roads and highway structure,

preserving forests, disease of trees, technology; fourth year, meteorology, materials, timber structure, hydraulics, geology, milling, local markets, fire protection, etc.

All these subjects with some four or five others were covered by the art course of the University and by the expenditure of an amount between two and three thousand dollars, a professor could be obtained who, with the present course, would give this province a system that would be second to none anywhere.

Mr. J. Fraser Gregory of St. John addressed the gathering. He was sorry that so few were present from St. John. His lumber interests were practically in Quebec, but as an inhabitant of the province he was much interested in our lumber. He did not think that the programme as outlined dealt with the practical side of the question. No mention was made as to the formation of an association, nor of the question of pulp wood. This pulp industry did more to destroy our forests than anything else. Another matter not mentioned was that of survey of lumber. The present system was not a correct one and could not be remedied too soon. He would move as a resolution that three committees be appointed, one to advise as to the formation of an association, a second committee to draw resolutions along the lines of forest reservation and a third, composed of lumbermen, to present a resolution from their points of view.

Hon. W. B. Snowball, in seconding the resolution of Mr. Gregory, made an excellent speech. He agreed with all Mr. Gregory had said and spoke in the highest terms of the address delivered by Chancellor Jones. He would strongly advocate the teaching of forestry and thought it would be of great advantage to the young man if he could take a short course in the winter, say of two or three months. Mr. Gregory's resolution was carried unanimously, and the premier said he would appoint the committees later on.

Dr. J. R. Inch took as his subject *The Relation of Forestry to Our Public Schools*. He said that his address would be brief as Chancellor Jones had covered much of the ground he intended speaking on. He must say that the school and its children formed the most important foundation of forestry as it did of all other questions. Education forms the minds. What can the school do in the interests of forestry may be asked. There are two things we have been trying to do with our schools in the way of teaching forestry, the first is that of nature study, to which eight years of the children's study is devoted. Dr. Inch spoke of the great impression made in the child by this study. Tell the child by explaining to him after showing him

nature's work of the growing of trees and plants, and the child will take a greater interest in this than anything in way of other teachings. The other line is what is called Arbor Day, the setting aside of a time for the planting of trees. It has not been successful in past, but this has been owing to inactivity of trustees, who have allowed trees to be neglected, and when Arbor Day comes around the work of the previous year has been destroyed, Dr. Inch spoke of the consolidated school and how Arbor Day had been preserved and it was hoped that the lesson put forth from this school would result in benefit to other schools. All teachers throughout the province would and must sympathize with the object of this convention; all must regret the great destruction done to our forests in the past, and all hoped for a bright future. Our school yards should be made attractive; everything should be done to make the children happy in their surroundings.

Mr. T. B. Kidner, of the Normal School, was the next speaker, his subject being, "What the manual training schools can do in arousing interest in trees and their protection." Mr. Kidner gave a description of the work accomplished by the manual training school. There were twenty of these schools in the provinces. Children between the ages of 11 and 12 to 14 and 15, were instructed a half day each week. No one was trained with any special objective view any more than to give the pupil a practical insight into a line not reached by any text-book. The training was most valuable, at the age the lessons were taught, and could not but make a lasting impression upon the mind. The pupil learned the different kinds of wood of our forests and learned to appreciate their value. Mr. Kidner concluded by giving a most interesting account of the way the subject was taught, illustrating his remarks by charts and various kinds of woods.

Lt.-Col. Loggie, of the Crown Land Department, had as his subject "Forest Reservation." His paper he announced, he had read some years ago in Quebec. He dealt exhaustively with the subject and gave some most practical suggestions for protecting our forest wealth. The three great owners of land in this province, regarding lumber, are the New Brunswick Land Co., the Alex. Gibson Co., and the American Syndicate, the latter being the purchasers of the Wm. Richards Co., on the Miramichi. Mr. Loggie described the land occupied by each of these great concerns and the amount of lumber cut.

EVENING SESSION.

At the evening session the programme opened with the reading of a paper by Dr. Bailey of the University, written by Prof. Penhallow of McGill on the subject, "The pulp industry

of Canada," with lantern illustrations by G. N. Babbitt of Fredericton. The writer told of the early history of pulp making. The earliest record of paper making was by the ancient Egyptians in 6000 B.C.; in the United States the manufacture of pulp began in 1854. In 1900 there were 763 factories, with a total value of \$167,507,713. The total value of the products was \$127,286,162.

In Canada there were in 1900, forty pulp mills in operation, with a total capital of \$20,000,000, and an annual output of 470,700 tons of pulp. In 1900 the total value of pulp and pulp products exported was \$2,718,788, and in 1901, over \$3,000,000. In 1897 the total value of wood pulp exported from European countries amounted to \$16,468,080, while in 1900 it had risen to \$18,000,000.

Hon. C. N. Skinner addressed the gathering, taking as his subject Forestry with its Relation to Agriculture. It would seem at first that the farmer was little interested in forestry, but consideration would show that agricultural and forest interests had much in common. When man was created Nature said to that man, "Now you go on and operate." Nature builds no modern work of mankind. Man has not proved true to his trust. Instead of a builder he has become a destroyer, and the first thing he started to destroy was himself. The lumbermen have only carried on the work of their forefathers and tried to do much injury. So now the legislature is asked to step in and protect Nature. The world would not have been finished if the tree had not been made. The land would have been uninhabitable, and so if trees are destroyed man is doing away with the heritage given him. Trees were required for carrying on Nature's work. The earth was prepared for agriculture, and he stood here to fight on behalf of the primitive man. Those who are the foundation fall. The world could not succeed without the farmer. The latter has not done his work so well. He has destroyed the trees and caused emigration to the west. The speaker remembered how the Tobique was so beautiful in trees at one time and how it has been changed. The agriculturist is interested in our forests. The destruction of forests meant the sapping of our soil and drying up of our rivers. Mr. Skinner ended a happy speech with an eloquent peroration on behalf of agricultural interests.

Hon. H. R. Emmerson, minister of railways and canals, the last speaker of the day, was received with much applause. His subject was "Opportunity and Outlook". He was glad that New Brunswick took such a deep interest in a matter so vital to its interests. When he had received the invitation to be present his leader expressed a strong desire that he, Mr. Emmerson, if he could possibly arrange it, should come, and he wished the

speaker to convey to the convention his warmest greeting, and hoped that the undertaking would be a boon to the people of New Brunswick. An important reason which had prompted him to be present was the great interest the department of railways took in forest preservation. His deputy has given much time to the subject, and particular attention was being paid to forest fires caused by locomotives and of procuring an improved smoke-stack as protection in this regard. Two little words might be chosen as a text. They are "I see." Perhaps there were no two words used more than these, and those who use them do not see. He fancied Adam used these words, but he did not see, and as for illustrations he need not go outside the county of York. A great many men have said "I see" when they thought they saw. Did you ever see the debris on the river bank or walk along the forest road and view the waste, or across the farm and see the destructive fences. In the counties on the North Shore the destruction of cedar fences in value would more than pay the public debt of the province.

The speaker had realized in his three years' experience as minister, because the matter of lumber had been brought particularly under his observation, that all lumber required for the I. C. R. had in many instances doubled in price in that period. Mr. Emmerson spoke of the vast waste and the consequent increase in value, and said this would not have been if people had only seen when they thought they saw. A great many are looking to the west. Is there no opportunity in lumber here for the young? We have scores of lumber kings, but is all hope gone for those who are to follow? If that hope has reason to exist, why not this province do its duty in seeing that all may be encouraged with the outlook? He congratulated the Surveyor-General on the steps already taken in the shape of legislation. Legislation, however, does not always hit the mark. It is too often in the nature of a declaration than of an execution. In this connection Mr. Emmerson told a story when certain parties had requested him to make legislation when he was premier of the province. The legislation was impracticable, but the parties desired it for the simple reason that it was a declaration of principle.

So with our forests, don't content yourselves with legislation, that means only declaration of principle, but legislation, that means execution.

The Hon. Mr. Tweedie announced the following committees at the close of the afternoon session, appointed in accordance with Mr. Gregory's resolution:

General Forestry—Hon. J. F. Sweeney, Messrs. C. N. Skinner, J. P. Burchill, C. E. Lunn, D. Richards, Jas. Beveridge.

On resolutions—lumbermen: Messrs. J. F. Gregory, H. Hillyard, W. B. Snowball, A. H. Randolph, E. Hutchinson, D. J. Buckley, F. E. Sayre, Fred Anderson.

On resolutions—non-lumbermen: Hon. A. R. McClelan, J. D. Hazen, A. H. Legere, G. F. Hill, G. U. Hay.

MORNING SESSION.

FEBRUARY 21ST.

The proceedings opened with an address by Hon. C. W. Robinson. Mr. Robinson prefaced his remarks by reading a paper written by W. W. Andrews, of Sackville. The speaker contended that one half of the stumpage of the province was not collected. He thought our forests might be greatly improved by planting the burnt districts with spruce. He was very anxious that his remarks might bring out a discussion, as he thought more was to be learned from discussion than in any other way.

A discussion followed in which H. M. Price, Hon. Mr. Burchell, Mr. Fish and Mr. Stewart took part. A resolution was submitted to the convention by the committee appointed yesterday recommending the formation of a New Brunswick Forestry Association in affiliation with the Canadian Forestry Association, with the object of protecting our lumber lands and improving the lands and planting of shade trees, etc.

The resolution unanimously passed:

H. M. Price, of Quebec, delivered an excellent address on "The Lumbermen's Interests in the Preservation of Forests." Mr. Price told of methods adopted in Quebec.

Mr. Power, M. P., of Quebec West, who was present on the invitation of the Premier, addressed the convention.

The rest of the morning was taken up with the reading of papers.

James Beveridge, of Chatham, read a paper on "Dependence of Business Interests in Forests."

W. B. Snowball, Chatham, read a paper on "The Value and Importance of Lumber Business to New Brunswick," and A. E. Hanson, Fredericton, read a paper on "Protection and Preservation of Forests."

RESIGNATION OF MR. E. STEWART, DOMINION SUPERINTENDENT OF FORESTRY.

Mr. E. Stewart, who has held the position of Dominion Superintendent of Forestry since the organization of that office, has submitted his resignation to take effect immediately. It is Mr. Stewart's intention to engage in the lumber business so that his interests will still be in the forests directly.

Previous to Mr. Stewart's appointment as Superintendent of Forestry he resided in Collingwood where he enjoyed the confidence of his fellow citizens so fully as to be elected mayor of the town. By profession Mr. Stewart is a land surveyor and has combined with it an interest in lumbering. His ability in the survey of timber and the judging of forest properties is unexcelled. Mr. Stewart is also one of the founders of the *Canadian Magazine* and has taken a live interest in public questions affecting the welfare of the Dominion.

The practise of his profession took him into the forested districts of the country and he was strongly impressed with the destruction which was being wrought by fires and the careless and unscientific manner of dealing with the forests. He brought the question before the Surveyors' Association for discussion and mainly through his efforts it was so strongly pressed upon the attention of the Dominion Government that it was decided in 1899 to establish an office in the Department of the Interior to carry out a Forestry policy. Mr. Stewart was invited to take charge of this office and accepted the task of formulating a policy of Forest administration and organizing the service. The success which has attended his efforts is shown in the work which has since been accomplished and in the sure and strong position which the whole Forestry movement holds in public opinion.

The Forestry work under Dominion administration divides naturally into two branches. One branch is that of tree planting on the farms. The bare and unsheltered prairie has forced on the settler the necessity for shelter and fuel, but, though this condition was long recognized, no adequate effort had been made to remedy it. The Superintendent of Forestry outlined a scheme for supplying the settler with young trees and for giving them expert advice in preparing the soil, planting, etc. This plan has so thoroughly met the case that it has received general approval and up to the present time 7,000,000 trees

have been distributed to farmers. The beauty and comfort added to the homes of the West by this policy will be a lasting monument to Mr. Stewart's wisdom and foresight.

In the division of forest administration the most pressing need was protection from fire. No special officers were designated for this purpose nor any concerted effort made to deal with this danger. Mr. Stewart's first efforts were directed to establishing a preventive service and this has been done so far successfully that it has received the highest commendation from lumbermen and others interested in forest preservation. The direct results have been to save large quantities of timber for the public use and to the public revenues at a comparatively small cost.

The separation of the non-agricultural from the agricultural lands and the erection of the former into forest reserves to be administered with a view to a permanent timber supply and the preservation of the sources of streams was a policy strongly advocated by the Superintendent of Forestry, and he was successful in inducing Parliament at its last session to pass an act establishing a number of forest reserves in the West aggregating 3,406,080 acres. These reserves are being examined thoroughly with a view to their proper and scientific management.

While dealing directly with Forest administration on Dominion Lands Mr. Stewart did not forget the claim upon his office to bring the Forestry question to the attention of the people of the whole Dominion. This he has done by means of lectures, and writings and especially through the medium of the Canadian Forestry Association which he initiated and which has become a strong force in moulding public opinion. Mr. Stewart now holds the position of President of the Forestry Association.

Mr. Stewart has good reason to look back with pride and pleasure on the movement which he has initiated and organized and can feel the satisfaction of having accomplished a work which actually and potentially, is of the greatest moment to the welfare of the Dominion. Mr. Stewart will carry with him the best wishes of all those who have been associated with him in the Forestry movement and they feel assured that his interest, though less direct, will be none the less strong in the work which he has so well inaugurated and that his help will be given as cheerfully as always in all that may be done to advance the forest interests of the Dominion.

AN IMPROVEMENT IN THE FOREST SCHOOL AT YALE.

In their endeavor to include all in the course that may be of influence in training foresters most adapted for immediate work in the organization and management of reserves or practical and scientific work for private land owners and lumber companies, the directors of Yale Forest School have this year further extended the work in the woods. In the past it has been the custom for the seniors to spend three or four weeks in the fall or winter studying methods of lumbering and logging operations wherever they pleased. Then the final term of the senior year they have spent in the woods completing their course in field engineering, preparation of maps and working plans.

This year the course has been modified and instead of spending the few weeks in the camps in the fall the class remains at the school until March 1st. On this date they leave in a body for Grandin, Missouri, where four months will be spent with Instructors Bryant and Chapman.

During this period lumbering operations, conducted at Grandin, on a large scale, are studied, from the estimation of timber, running of lines, location and construction of roads and camps, and most economical means of exploitation of timber, to a practical consideration of the various methods of transportation of the logs to the mill. From surveys and studies made a working-plan for a large area will be prepared by the class. During this time the class will live in a lumber camp on the scene of operations and thus will become fairly well acquainted with another side of life in the woods.

About half the time will be spent at the mills in order that every one may become familiar with the varied problems of mill construction and management, and may gain experience in the manufacture, grading, piling, seasoning and shipping of lumber with knowledge of office and business methods. This study of the mill end of the business will be done individually so that the mill men will not be bothered by a large number of inquirers in one place at one time and also so that each man may get as much out of the experience as possible.

Such an extension of the university into the forest seems to be an ideal interpretation of a forest school. It does not tend to turn a man out from college only a technical theorist full of ideas hard won from scientific books which he may not be

able for years to practise, or which he may lack the initiative to modify, but it aims to fit him with just such a combination of technology and practice as will make him useful and marketable. The theories and principles of the whole previous course in the Forest School will strengthen the forester's judgment and observation so that he will with more assurance and skill be able to conduct the operations of valuation and exploitation which might be required of him by a lumberman, or to outline a plan for conservative management, improvement or restocking such as a private land owner would desire, or intelligently consider the wide-reaching plans of organization or the strictly scientific and economic tree studies of the national forest reserves.

RESIGNATION OF MR. CRAIG.

The difficulty of retaining good men in the Government service while the present inadequate salaries are paid has been recently emphasized by the resignation of Mr. Roland D. Craig, late Inspector of Forest Reserves. Each year the Geological Survey Department loses some of its best men on this account, and now that lumbermen are realizing the importance of forest preservation and the introduction of approved forestry methods in lumbering operations, it is natural that they should look to government offices for experienced men. Ontario has recently lost the services of Dr. Clark, while in the Forestry Branch of the Dominion service, the late Superintendent, Mr. E. Stewart and Mr. Craig have both resigned during the past few weeks. Mr. Craig is a young man, but since his graduation as a Bachelor of Applied Science in 1898, his whole time has been devoted to Forestry work. After a two years' course at Cornell he graduated as a Forest Engineer with the highest honors. As an officer of the U. S. Bureau of Forestry (now Forest Service), he was at the head of a party conducting studies in the natural production of forest trees in California. On April 1st, 1904, he was appointed an inspector of tree planting in connection with the Canadian Forestry Department and parts of two seasons were spent in the west in this work. In 1905 Mr. Craig was appointed Inspector of Forest Reserves, in which year he inspected the Moose Mountain and Turtle Mountain Reserves. Last year he continued his work as Inspector in the Northwest and British Columbia. While the Government has lost a man whose place will be filled with difficulty, Mr. Craig's experience in practical forestry and his love of the work make it certain that the results of his experiments in British Columbia will serve as an object lesson to others and increase the demand for experienced foresters.

THE FOREST SERVICE OF THE UNITED STATES.*

BY OVERTON W. PRICE, ASSISTANT FORESTER.

First of all, it is my great pleasure to express to you the hearty good wishes of Mr. Gifford Pinchot, chief of the Forest Service, as well as his deep regret that the urgent demands of our work upon him made it impossible for him to attend this meeting of your association.

It is a very keen pleasure for those of us who are in forest work in the United States to meet in this way you who, with so much vigor and effectiveness, are striving to bring about a better use of the forests of this great country.

It is with very deep satisfaction that the forest service has noted the growing intercourse between Canadian foresters and foresters from the United States; and permit me to say right here in recognition of your consistently helpful attitude, that I don't believe there is a forester in the United States to-day who would not call for help or advice upon one of you, with just as assured a feeling of getting it as if it were asked from some one on his own side of the line.

We shall do all in our power, as you are doing, to keep alive this spirit of helpful co-operation. The problems before you and the problems before men in forest work in the United States vary in detail, but in essentials they are the same. The same fight for the forest against indifference, against ignorance, and against private interest of the wrong kind, is going on on both sides of the line. And it is the sum of the victories that is going to make the forests, not of Canada alone, nor of the United States alone, but of the whole North American continent, play their great part in its commercial and industrial development.

Now I would like to tell you—it will take but a few minutes—something of the progress the Forest Service is making. I believe that the branch of our work which will appeal most strongly to you is the result of the national policy in the creation, management, and use of forest reserves. We now have, as you know, 111,000,000 acres of these reserves, all west of the Mississippi River, lying mainly along the crests and upper slopes of the Rocky Mountains and the Sierras. From the point of view

*Address delivered at the Forestry Convention at Vancouver, September, 1906.



Chestnut fence posts. The tree from which these posts were made was over 3 feet in diameter and perfectly sound. It made 160 posts.

of acres this is a vast area; from the point of view of the urgent need of the region in which the reserves lie for a sustained supply of wood, water, and grass, it is pitifully small. Had our forest reserve policy been instituted sooner, there would have been a chance to include important areas which have long since passed into private ownership. If we now had, for example, your opportunity for the creation of forest reserves, they would comprise all the public land in the United States which can best contribute to the welfare of many rather than to the enrichment of the few; and that means, in my judgment, all mountain forests upon which water powers depend; it means all great public grazing lands, and it means all large bodies of commercial timber necessary to the development and to the permanence of local industries. By its failure to set aside all such areas as forest reserves, while still in public ownership, the United States will inevitably have to buy them from the private owners into whose hands they have passed, and buy them back at a cost which will be in the aggregate enormous, both for their actual purchase and for the expense incident to repairing the results of the misuse which they have suffered. No man can estimate what delay in the application of an active national forest policy has already cost, and will cost the United States.

But inadequate as they are for the national need, we have forest reserves enough to make their proper management a matter of the very first importance to the prosperity of the western United States. We are trying to make these reserves of the greatest permanent use, not to any one class of men or any one industry, but to all men and to every industry whose prosperity depends wholly or in part upon the forest. Above all, we are trying to help the home builder, the man who needs a little wood for farm use, a little water for irrigation, and a little grass for his stock, to help him win a foothold in a new country. Under the active application of this policy, organized opposition to forest reserves has entirely ceased. The reserves and their administration are still occasionally criticised by individuals and by corporations who want something for nothing, but organized opposition worthy of notice no longer exists. I believe this is partly the result of a straightforward administration of the forest reserves themselves; I believe it is partly the result, too, of a growing understanding by the people not merely of the practical wisdom, but of the absolutely vital necessity of our national forest reserve policy. If the west is to have wood for its farms, its mines, and a hundred other uses, if it is to have water to develop its splendid possibilities for irrigation, if it is to have grass for its cattle and sheep, then the mountain forests must be preserved; that, a great many of our people have come

to understand. And they have come to understand, too, that there is just one way by which these mountain forests can be adequately protected and conservatively and impartially used, and that is under government ownership and management.

The thing that remains is for the federal government to make good in the management of the reserves themselves. The key note to the policy which the Forest Service is applying in this work is co-operation. We are trying to keep constantly before us in every detail of our administration of the forest reserves the essential fact that they are for use. Our task is to see that the reserves are rightly used to the fullest extent, and in every possible way that will not interfere with their permanent value. The small settler receives free of charge, timber for home use, grass for his milch cows, and water to irrigate his farm. But commercial enterprises who are in the market for wood, water, or forage, are required to pay the market price. And I believe the reserves are none the less popular because we are making a fair charge rather than no charge or an insufficient charge for the property of the people, because we are trying to run these reserves on a business basis rather than on a bureaucratic basis.

The volume of business on the forest reserves is a fair index of their usefulness. We issued grazing permits this season for somewhat over one million horses and cattle and nearly six million sheep. Logging is now going on, on the reserves, under timber sales which aggregate about 728 million feet. And the volume of our business covering the use of water, and in many other ways in which the reserves are being actually used, is already large and is growing very rapidly. The receipts from the forest reserves will for this year be considerably over one million dollars. This falls very little short of what the reserves are actually costing at present. It is a thoroughly safe statement that within a very few years our forest reserves will be self-supporting, while at no distant period they will yield a considerable net return to the government. Already ten per cent of the revenue from the forest reserves is being paid to the states within which they lie, for the maintenance of schools and roads in the forest reserve counties. Improved methods of protection have gone hand in hand with increased use. There was one-tenth of one per cent. of the forest reserves burned over last year, only one-fifth as much as the area burned over the year before, when the reserves were not yet under the management of the Forest Service.

That, very briefly and very incompletely, is the status of the forest reserve work at present. We are trying to apply to the reserves not only as prompt and effective business methods as

possible, but also to heighten the technical standard of the work. It is very strongly our feeling that merely because as the result of temporary local conditions our forest methods are necessarily crude and extensive, rather than finished and intensive, is no reason to require a lower standard of training and experience in our men. We have one forest supervisor to every one and one-quarter million acres; a forest ranger to every 134,000 acres. By European standards, we should have 15,000 supervisors instead of 85, and 100,000 rangers instead of 800 to manage our 111 million acres. The European forester has not only less forest land to look after; he has hundreds of years of precedent behind him and a well-marked administrative and technical course to follow. Our foresters are without these advantages, and they need to be as good as natural ability, training, experience and esprit-de-corps can make them. That is the kind of force we are trying to build up.

The management of the national forest reserves is the most insistent and urgent part of the government forest work. But the Forest Service is also charged with the development of forestry throughout the United States. We are meeting that problem with the attempt, through our publications and through practical study on the ground, to bring forestry before the whole people. We have 111 million acres of forest reserves in the United States, but we have about 500 million acres in the timber tracts and woodlots of private owners. Practically all forest land east of the Mississippi River is in private hands. Few, very few, of these private owners are practising forestry upon their holdings, even to the extent of protecting them adequately from fire. And it is from these private holdings that the future timber supply of the United States must mainly come.

We cannot make every farmer, every owner of timber land, a professional forester, but we can bring the purpose of forestry, its practice and its results, plainly before the people. The Forest Service is doing all that lies in its power to make the principles of forestry household knowledge in the United States. No power on earth except a healthy public sentiment can insure a really national economy in the use of the forest. And to bring that about means, in the judgment of the Forest Service, a vigorous, sustained, educational campaign. It means, if forestry is really to arrive in the United States, that a general intelligent understanding of it must form part of the educational equipment of every thinking man and woman—otherwise it must remain an exotic, a purely governmental enterprise, insignificant in its national result. It is with this in view that the Forest Service devotes no small part of its resources to purely educational work. This work has two important phases—study of practical forest

problems in co-operation with private owners or users of timber and the publication of their results and their wide distribution, for the benefit of all. These co-operative studies began with the preparation of working plans for the timber tracts and woodlots of private owners, under an arrangement by which the owners and the government bore an equal share of the expense. The sphere of this co-operation has now widened until it includes the preparation of planting plans, studies of the best methods of economy in the use of forest products, and practically the whole field of applied forest work.

In addition to the care of the reserves and to the co-operative and educational work, the Forest Service has a wide field before it in the study of those forest problems which are essentially national in their scope—problems whose solution is beyond the means or power of the individual and which he cannot properly be expected to take up—but upon whose solution hangs a more profitable use of the forest and its product. In this field we are at five laboratories testing the strength and other qualities of various timbers, work of great practical value to all users of wood. We are studying the best methods of management of important commercial trees, we are making forest maps, we are investigating the best means of preventing forest fires, both by legislation and on the ground—these are a few of the ways in which we are trying to be of help.

Now just one thing more. I have not attempted to go into details as to the government forest work in the United States, but merely to tell you of essential progress along main lines. The Forest Service is now an organization of some size, and the scope of its affairs is considerable. But the work it has done and is doing is insignificant compared with the work it still has to do; we are not resting on our oars. What the Service has accomplished and its capacity for further accomplishment is due, in my judgment, more than to anything else, to working always under the principle that the forest is for use, to its meeting forest problems not by paper work but by practical study on the ground; and to trying to get forestry into effect, not merely by propaganda, not by a policy of arbitrary interference, but by co-operation. This is what has kept us out of the rut of officialdom, and it has been said that the only difference between such a rut and the grave is the length and the breadth.

FOREST REVENUES AND FOREST CONSERVATION.*

BY JUDSON F. CLARK.

In the case of most crops produced by the soil there is a distinct seed time and harvest and the methods of the seed time are as different as may be from the methods of the harvest. Wood crops form a notable exception to this rule, for normally the new crop is launched by the act of harvesting the crop which is mature. Where there is no wood crop to harvest, artificial sowing or planting must be resorted to if a wood crop would be grown, but in Canada the areas which must be so treated are limited and comparatively unimportant.

Nature, unaided by man, has produced vast and magnificent forests and maintained them for ages. The earliest foresters went to Nature centuries ago to learn her method of forest reproduction. They found that wherever trees were removed by decay, windfall, or other cause so as to make a break in the forest cover, and thus admit light to the soil, the opening became quickly filled with a vigorous reproduction of young trees. Trees are tolerably prolific seeders, but tree seeds on germination require light if they are to develop into forest trees. The more light they get the more rapidly they grow, and light may be given them by the removal of the mature trees. Such were the lessons learned from Nature by the first foresters, and the natural laws behind these lessons must ever form the basis of all natural methods of forest conservation.

The forester was quick to see wherein man might aid Nature to the advantage of the forest. Nature's method of waiting an age for the trees to disappear after they had passed their prime was wasteful alike in time and material. The forester with his axe saved the material and the time. In the virgin forest the fittest to survive occupied the soil, but the fittest to survive were not always the best fitted to supply the needs of man. This was remedied by the forester in the succeeding crop by favoring as seed trees those kinds which because of rapidity of growth or quality of product were regarded as the more desirable.

THE CANADIAN FOREST PROBLEM.

There can be little doubt but that the most important problem before any Canadian forest administration is that of

*Address delivered at the Forestry Convention, Vancouver, September 1906.

translating the facts of these introductory observations into everyday business practice. The solution of the problem will be reached when a system of sale of public timber is evolved and made effective, by which the state and the lumbermen become partners with mutual profit in the work of renewing the forest by the act of logging the mature trees.

THE IMPORTANCE OF SELLING RIGHT.

Lumbering is very much like any other business in that it is conducted for what profit may be made by the operators, and rightly so. This being the case, it is evident that the nature of the agreement entered into by the state as the seller of the timber and the lumberman purchaser will have very much to do in determining the subsequent course of events. If the state offers its timber for sale under conditions which put a premium on forest destruction, the forests will surely be destroyed, all kinds of forestry propaganda to the contrary notwithstanding. If, on the other hand, the terms of sale put a premium on forest conservation, there is no reason why the forests should not be conserved as a purely business proposition.

Present lumbering methods are devastating the Canadian forests. Why is this? Lumbering is the business of removing the mature timber, and this should improve the forest. It has done so elsewhere for centuries. Not in Europe and Asia alone, but in many places in North America. Why does it not do so on the Canadian timber limits? There are, indeed, isolated examples of improvement by lumbering even here which show the possibilities, but the exceptions to the rule but emphasize the failure of the present policy as a whole.

It is my belief that the fatal weakness of the present system of disposing of provincial timber is to be found in the fact that the provisions of the agreements entered into by the provinces as sellers and the lumbermen as purchasers place a premium on destructive lumbering. In other words, the terms of sale which have found general acceptance make it to be in the financial interest of the operators to despoil rather than to conserve the forests.

It is my purpose in this paper to discuss two or three salient features and at least one notable omission in these agreements, with special reference to their influence on the character of the logging which they authorize, and should but do not control.

THREE AXIOMS.

Before entering upon what may prove to be controversial ground, it seems fitting to state three propositions which I think will be accepted as axiomatic for Canadian conditions. These

may later serve as landmarks when weighing the pro's and con' of individual propositions.

1. The main object of all forest management should be to ensure the permanency of the lumbering and other wood-workin industries by providing a permanent supply of logs which is the raw material. Incidentally, or at least secondarily, forest management aims to regulate the flow of streams, to secure a reven to ameliorate climatic conditions, and to provide a playgrou for the people.

2. Wherever forests naturally flourish they may be perpetuated and improved by conservative lumbering. The Whit Pine and the Douglas Fir are among the best trees in the worl for this purpose.

3. If the forests are to be saved, it must be with the sym pathetic co-operation of the men who cut the trees. Nor is this at all a matter of regret, for no class of citizens are more vitally interested in the perpetuation of the forests or would do more to that end than the lumbermen.

SALE BY PUBLIC AUCTION.

The principal of valuing stumpage for sale purposes by offering it at public auction has long found favor in the older provinces, and I note that British Columbia has recently taken legislation providing for its adoption. There can be no doubt but that public auction, after ample advertisement and opportunity for inspection, is by far the simplest, most equitable, and above all the most satisfactory method of determining the market value of standing timber.

This sale by public auction may take either one of two forms:

(1) The stumpage dues (i.e., the price to be paid per thousand feet when the timber is cut) may be fixed in advance of the sale, and bids may be asked for a *lump sum* or "bonus" which will represent the estimated value of the stumpage over and above the fixed stumpage dues; or (2) Bids may be asked on the amount of *stumpage dues* to be paid per thousand feet board measure when the timber is cut.

THE BONUS SYSTEM OF AUCTION.

The first method, which may for short be termed the bonus system, has found general acceptance almost to the exclusion of the second. The advantages claimed for it are:

(1) That it yields at once a large revenue to the provincial treasury; and

(2) That it gives the purchaser of the stumpage a larger interest in protecting the forest from fire.

ADVANCE PAYMENT OF FOREST REVENUE.

The payment in advance in the form of a bonus of a portion of the estimated value of the stumpage to be cut during a period of years is in reality a *discounting of the future revenue producing capacity of the forest*. This method of realizing a large present return from what is a permanent provincial asset capable of yielding a regular annual income can, it seems to me, be justified only as a means of meeting a financial emergency of the gravest character. It is worthy of remark in this connection, that even the stress of war has never led the forest owning countries of Europe to resort to this method of temporary relief for their depleted treasuries.

FIRE PROTECTION.

It is evident that the payment in advance of a portion of the value of the timber must give the lumberman a larger interest in the protection of the timber purchased from fire. The advantage to the forest of the interest thus created is, however, more apparent than real. The interest created centres naturally in the protection of such timber as is available for the axe under the terms of his purchase. The greatest danger from fire is not, however, on areas bearing mature or semi-mature timber, but on *cut-over lands* and such as *bear quite young coniferous stands*. It is evident that the motive for protecting an area from fire, created by an advance payment of stumpage, disappears as soon as an operator removes all the timber in which he has a financial interest. It might be added that it is a mistake to suppose that in determining the amount of "bonus" which he is prepared to bid on a proposition, the lumberman or pulp manufacturer does not discount for the danger of subsequent loss by fire and the expense involved in future fire ranging.

It will bear emphasis in this connection that a province's ultimate financial interest in young coniferous stands and cut-over lands may be quite as great as in areas at present bearing mature timber; and also that any division of interest or responsibility in so vital a matter as forest fire protection is attended with the gravest dangers.

DISADVANTAGES OF THE BONUS SYSTEM.

The disadvantages of the bonus system may be discussed (1) from the standpoint of the operator, and (2) from that of the province.

1. From the operator's standpoint:

(1) *Capital Tied Up*.—The payment of a portion of the stumpage cash-in-advance locks up a large amount of capital (or credit) which should normally be used in the development

of the business. This prevents the participation in the competition of persons or corporations having no surplus capital (or credit) over and above what would be sufficient to conduct a lumbering business on the plan of paying for their raw material when they require it. This unfair discrimination in favor of the large capitalist as against others of less but sufficient means, cannot but have an undesirable effect on the prices realized, in that it limits the number of persons in a position to compete.

(2) *Increased Cost of Inspection.*—It greatly increases both the cost and the time required to make an adequate inspection of the tract offered, in that the prospective purchaser must estimate the *amount* as well as the value of the stumpage offered before he is in a position to bid on the proposition. This again limits the competition to the detriment of the interests of the public.

(3) *Cost of Raw Material Uncertain.*—The estimates of the amount of available stumpage which can be made by prospective buyers being necessarily only approximate, this method of sale introduces a large *speculative element*, in the cost of the raw material. As a matter of fact, an operator purchasing under the bonus system never knows what his raw material actually costs him until the logging of the tract has been completed.

2. From the standpoint of the province as seller:

(1 and 2) That the bonus system of auction operates disadvantageously to the province in that it causes much irregularity in the forest revenues has already been commented upon; as has also its undesirable tendency to limit the number of competitors in a position to bid at timber sales.

(3) *Large Losses to Revenue.*—In the absence of accurate knowledge as to the amount of standing timber on a limit, the purchaser must bid on the basis of an amount which he is confident is there and available located, after discounting for all uncertain factors. Should there prove to be twice or three times as much merchantable timber found before he is through cutting—as has repeatedly occurred—the difference between the market value of this “found” timber and the nominal stumpage dues finds its way into the pocket of the operator instead of the provincial treasury, as would have been the case had the *amount of the dues* been the consideration determined by public competition.

A similar condition obtains on limits on which the right to cut extends or is extended over a long period of years. Advances in market prices, together with changes in uses, methods of manufacture, and means of transportation are constantly adding to stumpage values. These influences, together with the natural increment by growth, have made valuable much timber which,

because of its small size or unfavorable location, was thought to be wholly unmerchantable at the time of the sale, and as such failed to have any influence on the amount of bonus paid. The whole value of this timber belongs in equity to the province, but under the bonus system of sale the nominal stumpage dues only, representing in many cases but a small fraction of the market value, reach the treasury.

On the other hand, it is true that if the amount of merchantable timber should prove to have been over-estimated by the purchaser and he should fail to find as much as he paid for, the province stands to gain at the expense of the lumberman. Such a contingency is rare indeed, and is quite as undesirable as the reverse.

(4). *Bonus System Means Close Cutting.*—Quite over-shadowing any objection which may be taken to the bonus system of sale from the standpoint of present revenue returns discussed above, is its baneful influence on the future production of the forest. Its whole tendency is towards clean cutting as contrasted with the opposite tendency where the amount to be paid per thousand feet cut is made the basis for the auction.

Assume, for illustration purposes, a pine stand estimated to cut ten million feet of mature timber which has an average market value of ten dollars per M as it stands, or a total of \$100,000. If sold at public auction on a stumpage basis for \$10 per M, the operator will cut no trees which when manufactured will not yield at least \$10 per M over and above the cost of manufacture. Suppose, however, that \$80,000 of the purchase price be paid cash in advance in form of "bonus" with the stipulation that the remaining \$2 per M be paid as stumpage dues when the timber is cut. The same operator, who in the first case found it in his interest to cut no trees which were not worth \$10 per M on the stump, will now find it in his interest to cut whatever may have a stumpage value of \$2 per thousand. The cutting of the young pines having a stumpage value of between two and ten dollars per M, may under some circumstances be the main difference between good forestry and destructive lumbering.

(5) *Bonus System Places a Premium on Violation of Cutting Regulations.*—Should it have happened that in the sale of this block of pine the province should have reserved trees required for seed purposes, or all trees below a set diameter limit that they might form the basis of future cuttings, it is evident that a purchaser under the bonus system having advanced \$80,000 in cash, and being in a position to reap a large profit from cutting the reserved trees (because of the low dues) would be under a very great and constant temptation to do so. It may indeed well be doubted if the enforcement of reasonable cutting regu-

lations be at all practicable under this system. Certain it is that up to the present it has not been successfully accomplished.

AUCTION SALE BY THE THOUSAND FEET.

The placing of the whole payment of the lumberman's price for the logs as stumpage dues of so much per thousand feet to be paid when the logs are cut, and the determination of the amount of the price by public competition meets every objection which can be taken to the bonus system of auction, whether viewed from the standpoint of the operator or that of the province.

Large capitalists, who can command sufficient credit to deal in timber lands under the bonus system of auction, would very probably not look with favor on a change to a form of auction which would divert a much larger proportion of the natural increase in stumpage values to the provincial treasury. It would, on the other hand, be warmly welcomed by operators of limited capital and would work injustice to none.

Its practical application on a very large scale on both public and private lands, has abundantly proven its practicability and efficiency and its special value as an aid to conservative forest management.

It will bear emphasizing here that what is said below in regard to the desirability and necessity of defining and protecting the rights and duties of both parties to sale contracts applies equally to sales on a stumpage basis. Experience has shown that the point to be especially cared for under this form of sale is the prevention of waste of inferior material in the woods. Neglect of this matter may lead to serious loss and bring undeserved discredit on the system.

CUTTING REGULATIONS.

Wherever state or private forests are managed with a view of continued wood production, the most important feature of a sale of standing timber is the agreement as to the rights and duties of the contracting parties. This usually takes the form of a code of regulations specifying what trees are to be cut, the care to be taken in the felling and removal of the timber, and similar matters.

These cutting regulations are of course drawn up in advance of the sale, and the prospective purchaser makes his bid with a full knowledge of what will be required of him should he be the successful bidder. A feature of these agreements is usually the giving of a bond by the purchaser as security for the faithful performance of the contract in accordance with the regulations.

A FATAL OMISSION.

The dearth of any effective measures to control the cutting on Canadian limits is an outstanding feature of the present forest policy or lack of policy. Perhaps the forest departments have acted on the theory that the lumberman's interest in future supplies of logs would insure careful and conservative cutting. Perhaps it has been because there has been no public demand for it—the public knowing nothing whatever about it. Be the cause as it may, the absence of such regulation has long since ceased to be a danger merely. To-day it is nothing short of a disaster; a disaster alike to the future of the lumbering industry and to the future forest revenue.

RETRO-ACTIVE CUTTING REGULATIONS.

The reservation, by the provinces, of the right to change from time to time the terms under which the timber already sold might be logged, is of interest in this connection. If I mistake not, British Columbia has also adopted this feature in her recent forest legislation.

In so far as the rights reserved by this provision are exercised for the general public good in meeting unforeseen or unforeseeable contingencies, the reservation serves a just and useful purpose. In so far, however, as it is merely an aftersight method of providing regulations for the control of logging operations which ordinary foresight would have provided in advance of the sale, it must be regarded as unwise and unjust, and therefore impotent. Certain it is, were the powers thus reserved at all frequently called into requisition, it would quickly transform the purchase of public timber from a business proposition to a mere gamble with a vast deal of lobbying and wire-pulling thrown in. Needless to say such a state of affairs would work great injury to the lumber interests and to the forest.

"GROUND RENT" TAXATION.

A feature of all Canadian timber sales is the imposition of a land tax or "ground rent" per unit of area. British Columbia has made the imposition of a very high land tax a distinctive feature of her forest policy.

Whether a tax of this character is to be desirable or wholly undesirable from the standpoint of forest conservation, depends altogether on which party to the contract is to practise the forestry.

If the province grows the timber and merely sells the stumpage when it is mature, distinctly specifying what trees are to be cut and how and when they are to be cut, there can be no objection to the payment in this way of a small portion of the market

value of timber sold, and it may indeed serve a very useful purpose in preventing purchase for speculative purposes by others than bona fide operators.

Should, however, the responsibility for caring for future wood crops be left to the lumberman, as it has been in the past, it will be necessary for him when planning logging operations to consider carefully whether it will pay him to cut with care that he may return again after a period of years for a second crop—reasonable safety from fire being assured—or whether the tax will eat up the profit of any yield that he may hope for, over and above what can now be realized by cutting clean without regard to the future. This is the only point of view from which the lumberman as a business man can regard the logging of lands under his control.

The following table gives the annual "ground rent" payment per square mile for the different provinces and on Dominion lands, and the sums to which these annual payments amount for different periods of from 30 to 100 years. In this computation money is reckoned to be worth 6% compounded annually, which is below rather than above the mark for capital invested in immature forests on wild lands.

RELATION OF "GROUND RENTS" TO CONSERVATIVE LUMBERING.

		30 yrs.	40 yrs.	50 yrs.	60 yrs.	80 yrs.	100 yrs.
Ontario & Quebec..	\$ 3.00	\$ 251	\$ 492	\$ 923	\$ 1,686	\$ 5,611	\$ 18,418
Ontario (recent sales) and Dominion lands east of Yale,							
B. C.....	5.00	419	820	1,539	2,809	9,352	30,697
New Brunswick.....	8.00	670	1,312	2,462	4,495	14,964	49,114
Dominion lands west of Yale.....	32.00	2,682	5,150	9,848	17,979	59,856	196,458
British Columbia.....	140.00	11,732	22,967	43,085	79,118	259,195	836,759

From this table a lumberman may see at a glance what his tax bill will be when he returns for a second logging on his lands. To make a second logging profitable he must find on his return a stumpage value, *over and above the then government stumpage dues*, sufficient to offset the two following items before he can reap any return other than interest for his invested money:

(1) The value of the trees which he refrained from cutting at the first logging together with compound interest on this value at, say 6%.

(2) The tax bill, which at \$5.00 per annum per mile, will have amounted to

\$	419	at 30 years
	1,539	at 50 years
	9,352	at 80 years
	30,697	at 100 years

Particular attention is directed to the manner in which the tax bill runs up the longer the time between loggings. This is the most significant feature of all taxation where the tax is annual and the return periodic.

Where the lumberman is the forester the whole influence of a ground rent is towards *early utilization* and *clean cutting* with the *abandonment of the land after the destruction of the forest*. The practical effect of this tendency in any given case will be in proportion to the amount of the tax. In Ontario and Quebec where the rate is \$3.00 per square mile over large areas, the injury is least; in British Columbia where recent legislation has placed it at \$140.00 per mile, it will be greatest.

Taxation at \$140.00 per mile can but have one effect. Lumbermen will aim to remove at a single cutting whatever will earn a dollar at the moment, without regard to the future, for under such a policy of taxation it would be impossible to hope for satisfactory returns from conservative lumbering.

The imposition of a ground rent has been defended as a means of forcing the lumbermen to relinquish their holdings of cut-over lands to the province. If the lumbermen have any property rights in limits from which they have removed the purchased timber, it would surely be unfair to take this means of disposing them. If, however, their rights terminate with the removal of the purchased timber, other means can surely be found by which the province can obtain possession of its own. Certainly it cannot be expected that lands will be surrendered on account of "ground rent" taxation without first stripping them of what-ever might be marketed at a profit.

SELLING FAR IN ADVANCE OF TRADE REQUIREMENTS.

The policy of selling vast blocks of timber and pulpwood decades in advance of trade requirements, to be the happy hunting grounds of timberland speculators, has cost the forest revenues millions of money and will cost them many millions more. The province of Ontario has been very much more conservative in this regard than others which might be mentioned. And yet it would probably be safe to say that the average log cut in 1905 in the province of Ontario was sold a quarter of a century ago. This, of course, means that the average 1905 log is paid for at a price which has long since ceased to represent more than a fraction of its market value.

A reasonable time must of course be allowed for the removal of timber sold, but there is no justification for the enormous sacrifices in ultimate revenue made by the provinces by this practice.

Occasionally sales in advance of trade requirements have been prompted by a demand for the land for the purpose of agricultural settlement. More rarely the motive has been to utilize timber especially endangered by fire, but without question the controlling motive in the great majority of cases has been to secure for present revenue the comparatively trifling sums to be paid as "bonuses."

A SALE POLICY.

To insure that my criticism be constructive rather than destructive, I submit in conclusion an outline of a method of disposing of Crown timber which appears to me to offer a simple, practical, and business-like solution of the problem. It might be added that this method of sale in all its essential features has already proven its efficiency in practice in large transactions and under conditions not unlike those obtaining on the Canadian timber lands.

Preparatory.—A first step in the preparation for a sale of timber should be to make an estimate of the quantities of the different kinds to be sold for publication with the advertisement of the sale. An estimate of the value would also be made, this latter for the use of the forest department in determining their reserve bid.

Advertisement.—The advertisement in the case of large sales should be published at least a year in advance of the auction, that ample opportunity may be given for completing business arrangements looking to purchase, and for the exploration of the tract by prospective purchasers.

The advertisement should state the location and area of the tracts offered, the approximate stand of the different kinds of timber, and the time and place of auction. Intending purchasers should be invited to apply for information regarding the rules and regulations governing the cutting and removal of the timber, the manner of payment and other details.

Cutting Regulations.—The cutting regulations should be prepared with special reference to the individual tracts offered for sale, and would be governed by local conditions.

In general they would include:

The designation of the timber to be cut, and, conversely, specifically prohibit the cutting of timber not offered for sale—for example, immature timber under a set diameter limit.

Provision for care in the felling and in the removal of the timber.

Provision for the prevention of waste by limiting the height of stump, by prescribing the use of the saw where practicable, and by providing for the utilization of inferior materials.

Provision regarding the disposal of the debris—such as lopping tops, burning brush, etc.

The time limit for the final removal of all timber sold.

Specifications as to measurement of timber logged.

Adequate penalties for violation of cutting regulations, as for example, payment at double the regular purchase price for any merchantable timber left in the woods by the loggers.

Time and manner of payment.

Provision for a bond to insure the faithful performance of the contract by the purchaser.

Method of Sale.—By public auction, bids being asked on the amount to be paid per thousand feet when the timber is cut.

Ground Rent.—To prevent speculative purchase by others than bona fide operators a fairly high ground rent per mile might with advantage be provided for. The payment on account of ground rent for any particular year might be made to apply on the stumpage dues account for the same year. This would throw the whole weight of the ground rent taxation on the purchaser who failed to operate, and would at the same time provide automatically for release from taxation immediately that he actively undertook to carry out his obligations.

Unit of Area.—The square mile forms a desirable sale unit. This would give lumbermen of limited capital and jobbers an opportunity to do business on the public forest lands, and if the number of miles which any one concern may purchase be unlimited no injustice will be done the largest operators.

The Royal British Arboricultural Society and the Irish Forestry Society have joined in the publication of a QUARTERLY JOURNAL OF FORESTRY, the first number of which has recently been issued. It will be made up, in part, of records of the work done by these Societies, but its chief feature will be the publication of original papers on Forestry and kindred subjects. Committees on Arboriculture, Entomology, Home Forestry, Forest Education and Irish Forestry have been appointed, and these will co-operate with the editors in the work of securing suitable material for the new publication. Conditions are of course vastly different in Great Britain from those in Canada, but the initial number contains much of interest to Canadians, notably with regard to Forest Entomology, a branch of Forestry work to which not enough attention is paid in this country.

THE LUMBER INDUSTRY IN THE MOUNTAINS OF BRITISH COLUMBIA.

BY F. W. JONES, PRESIDENT OF THE WESTERN
LUMBERMEN'S ASSOCIATION.

(Read at the Forestry Convention at Vancouver, September, 1906.)

The lumber industry in the Mountains of British Columbia is such a very extensive subject that the few remarks I have to offer to-day will largely be confined to the needs of that industry in relation to Forestry, or as we see it, forest preservation.

At the same time a few facts in connection with the history of the Mountain lumber industry may be of interest.

Practically, lumbering in the interior dates back only to the commencement of the construction of the main line of the C.P.R. through the Rocky Mountains, about 22 years ago. The first lumbermen were the contractors, for bridging and other structures, who established saw-mills at various points to cut their timber in advance of the actual tracklaying.

The first of these were small portable mills, but a little later, as the track pushed ahead and the larger structures on the west slope of the Rockies and in the Selkirk range, had to be provided for, better mills were brought in and very large quantities of timber were cut for bridges, buildings, and the huge snow sheds around the summit of the Selkirks.

Another pioneer was Mr. Fred Robinson, originally a member of the Columbia River Lumber Co., who afterwards established a saw-mill at Revelstoke; the beginning of the large operations now carried on by the Bowman Lumber Co.

For about ten years the business increased slowly, a few new mills starting up along the Main Line and some in southwest Kootenay, for local trade, until the building of the Crow's Nest Line of the C.P.R. opened up a new timber area, and the pioneer in that district, Mr. A. Leitch, hauled a saw-mill plant from Golden to Cranbrook, about 200 miles, by wagon.

Mills increased in number rapidly after that line was completed, and the great development of the Northwest, which commenced about that time, soon caused a similar increase in lumbering operations, wherever railway transportation was provided, until now there are included in the Mountain Lumber Manufacturers' Association some 43 saw-mills, which are producing this season a cut well over 250 million feet, in spite of

late starting, on account of low water; several fire losses and the fact that scarcely any of these mills are running more than 10 hours per day. Even on the single shift these mills can turn out over 300 million feet and about double that figure if the market required it, and if labor could be obtained to operate them 20 hours per day—a very difficult matter indeed at present.

Along with this development in the volume of lumbering operations in the interior, there has also been a very considerable improvement in methods of logging, manufacturing and grading, and in trade conditions. Railways and steam donkeys have been introduced; band saws and gangs are fast displacing circulars, there being 15 double cutting bands working in the Mountains this season and more going in. The latest improvements in planing machinery are to be found everywhere; uniform grading rules have been adopted and are being well carried out.

The Mountain Lumber Manufacturers' Association has been a very great factor in the improvement which has taken place. The organization includes practically all those engaged in the manufacturing of lumber east of the Cascades.

These facts indicate that the mountain mills are already a considerable factor in the lumber production of Canada, and I think I am safe in making the prediction that before many years they will be the largest producers of lumber in Canada, if not in America. In stating this, I am, of course, counting upon the opening up of many new areas in the valleys that will be tapped by the Canadian Northern Railway and Grand Trunk Pacific Railway on their way through the mountains; on the continued development and prosperity of Alberta, Saskatchewan and Manitoba, which we all know is assured, and perhaps on the continuance of the invasion of American lumbermen, some of whom we have already welcomed to the mountains and many more will no doubt follow. And I am also counting upon the Dominion Government finally doing tardy justice to the lumber manufacturers of Canada, and imposing a duty on American rough lumber coming into Canada, and such action will, we feel, be followed by the United States Government removing their duty and establishing reciprocity on rough lumber.

Let me say here as representing the Mountain Association, that we are all in sympathy with the objects of the Canadian Forestry Association; that we are all members of that Association; that a great many of our members are here to-day, and that all the rest would be here if they could possibly have gotten away, but those of you who are lumbermen, will easily think of the varied difficulties that might arise to prevent it such as high and



Brulé in the Riding Mt. Forest Reserve.

low water; fires; bad saws; poor filers; delayed machinery; shortage of labor; shortage of cars; hard-hearted bankers; etc., in fact I used to know a lumberman, one of the "old timers" and one with a great command of language, who, when something happened that ordinary profanity could not cope with, could think of nothing worse than to "Hope you will have a saw-mill of your own some day."

In the mountains, reforestation is not a live issue at present, but our interest is to establish some better system of preserving and managing what the Almighty has given us and stopping the enormous destruction of standing timber by fire. We want better laws for dealing with fires; some attempt at a "Fire Ranging System" in the interior of British Columbia by the Provincial Government; more definite regulations covering the difference between agricultural and timber lands; a campaign of education under the auspices of the Forestry Association, as to the importance of preserving standing timber (even small growing trees which will not be fit to log for some years), putting down fires, and keeping squatters out of timbered areas and places where young timber is coming on; and an amendment of the Provincial regulations providing for such tenure and terms on timber licences that the lumbermen will be able to pay some attention to Forestry principles, in carrying on their operations.

First let me refer to the law governing the starting of fires, known as the "Bush Fire Act". This act, in its present shape, is almost useless, prosecutions are almost practically unknown, and when tried, have usually resulted in dismissal with a warning or nominal fine. The inherent weakness of the Act is in Section 5, which in the Act of 1896, reads:

"It shall not be lawful for any person to set out or cause to be set out or started, between the first day of May and the first day of October in each year, within any Fire District, any fire for the purpose of clearing land, unless the trees and undergrowth on such land shall have first been cut down and a space cleared around the margin or outer edge of the land which is to be cleared by fire, of sufficient width to prevent the fire from spreading and burning up the timber and forests adjoining or surrounding the land which is to be cleared by fire. The owner of any land on which fire shall be so made or started for the purpose of clearing the same, shall, by himself or his servants, constantly watch over, manage, and care for such fire, and observe every reasonable care and precaution to prevent such fire spreading as aforesaid."

But this was amended in 1902 by striking out all the provision calling for a fire guard, and the only responsibility resting

on the person who starts such a fire, is to stay and watch it burn. Without a fire guard to give some chance of cutting the fire off, and a large force of men, no ordinary care and precaution is sufficient should a wind spring up or the fire take to burning underground in dry roots, etc., as it frequently does.

The only provision for enforcing this Act is found in Section 14, which says it shall be the special duty of every Government Agent, Gold Commissioner, Timber Inspector, Forest Ranger, Mining Recorder, and Police Officer or Constable, to enforce the requirements of this Act, and in all cases coming within the knowledge of any such official, officer or constable, to prosecute every person or body corporate by whom there is reasonable cause for believing any contravention of this Act has been committed.

That they do not carry this out is well known, and that it is practically impossible to get anyone prosecuted, unless an information is laid by some lumberman or an owner of property destroyed, and then a conviction in the present state of the Act, is practically impossible, unless wilful and malicious burning can be proved; and in such cases, although I believe they are a great deal more frequent than generally supposed, it is naturally impossible to get direct evidence.

I would like here to quote from an address, delivered about a month or so ago, by Mr. J. R. Wertz, Fire Warden for State of Washington, before the annual meeting of the Pacific Coast Lumber Manufacturers' Association. Mr. Wertz says a great deal about this fire question so much better than I could say it, that I want to quote his address at some length:—

“Generally speaking we extend our protection to property because of its value, and we are now beginning the work of protecting our forests because timber is becoming valuable. It is necessary to go back a few years in the history of this state when the timber was considered of little value and the forests were looked upon as a hindrance to the development of the country. At that time the title to almost all of the timber land remained in the United States and much of it was not surveyed. The early settlers wanted lands suitable for farming and grazing. The prairie lands, and valleys covered with brush, where clearing was easy, were most valued and most sought after. Fires were set in the timber adjoining the farms or ranches during the dry season and allowed to burn unattended, regardless of ownership, for the purpose of broadening the scope of grazing lands. It was the practice of campers, hunters and others having occasion to build fires in the timber to place the fire where conditions were most favorable and where fuel was most plentiful. These fires were usually left burning and in some instances

would smoulder in the dry leaves, decaying vegetation and moss for days and if a brisk wind sprang up and conditions were favorable a great timber fire ensued.

"Many fires were started by careless and malicious persons just to see them burn, and if the fire spread and destroyed hundreds of acres of timber, as was often the case, very little attention was given the occurrence.

"A larger area of timber land has been cut and logged than has been burned over. *But more timber has been burned than has been cut and logged. It has been estimated that 30,000,000,000 feet have been cut and logged and that 42,000,000,000 have been destroyed by fire.* This estimate would hardly hold good at the present time, as we are now cutting timber at a very rapid rate. The careless and unrestrained manner of handling fire and the continued destruction of timber by forest fires demonstrated to the mind of every person who is interested in the preservation of our forests that some legislation was necessary on this subject and at the 1903 session of the legislature a law was enacted with this end in view. By this law the commissioner of public lands was made ex-officio state forest fire warden, and the county commissioners of the several counties of the state were constituted boards of deputy state forest fire wardens. They could, at their discretion, appoint deputy fire wardens in their respective counties and prescribe their duties, etc., and they were authorized to issue permits to burn slashings and the like. In most of the counties the boards of county commissioners, constituted as aforesaid, failed or refused to appoint such deputies, not caring to incur the expense.

THE FIRE PROTECTION LAW.

"The state legislature, at its 1905 session, enacted the law under which we are now working, known as the forest protection law. This law creates a state board of forest commissioners, to be appointed by the governor and to serve without compensation. The state board of forest commissioners have full power to appoint a state fire warden and to appoint deputy fire wardens in the timbered counties of the state.

"This is the first law which has been enacted authorizing the employment of an active, working force of men in the field to protect the timber of this state from the ravages of fire.

"Any law enacted for the protection of the forests would have little effect unless there is some person clothed with authority to see that its provisions are complied with. The deputy fire wardens are empowered to make arrests for violations of the law or they may report such violations to the prosecuting attorneys of their respective counties. There are

deputy fire wardens in twenty-two of the timbered counties of the state. Their duties are to patrol the heavily timbered districts and especially those portions of their counties which are frequented by campers, hunters, fishermen and others—warning such persons and apprising them of the penalties for violations of the law; to post large notices printed on cloth, containing portions of the law, with the penalties for violations thereof; to distribute copies of the law, in pamphlet form; to extinguish small or smouldering fires, which if allowed to burn unmolested until conditions were favorable would be likely to develop into disastrous fires. *Deputy fire wardens issue permits to burn slashings and it is their duty to ascertain if the burning will be attended with danger to adjoining timber or other property. If such danger exists they must supervise the burning in person or authorize some competent person to do so or they may refuse to issue the permit to burn while such danger exists.*"

The points I want to make from this quotation are two—first, that no Act alone will be effective, unless there is some official clothed with power to enforce the provisions of it, and secondly the requiring of a permit before slashings can be burned during the summer season, and the further requirement for inspection before the issuance of such permit; and supervision by a Fire Warden, of the burning, if necessary on account of possible danger to adjoining timber or other property.

The Mountain Association last February passed a resolution on this subject, which was forwarded to the Chief Commissioner of Lands and Works. This resolution was as follows:—

"WHEREAS, A great quantity of timber is yearly destroyed by fires starting by engines, clearing of lands, camp fires and similar sources, thus entailing heavy losses to lumber manufacturers, and loss of revenue to the Province, and

WHEREAS, A little watchfulness and effort at the outset on the part of some person or persons empowered to act would prevent these heavy losses, it is

RESOLVED, That this association requests the Provincial Government of British Columbia to amend the "Bush Fires" Act by appointing a number of Fire Wardens east of the Cascade range, and also constituting a representative of each member of this association and their foremen a deputy fire warden, without salary, who shall have authority to engage a necessary number of men and enforce their services in the suppression of bush fires, such engagement to continue until the fact of the existence of a fire be communicated to the nearest Government agent, or in any event for a period of at least 48 consecutive hours. The services of men so employed to be paid for by the Province, and it is further,

RESOLVED, That the Government be further requested to amend the "Bush Fires" Act by making it unlawful for any rancher or farmer or other person to set out any fire between the months of April and October, in any year without the written permission of the Fire Warden in the district. Such amendment to apply to that portion of British Columbia east of the Cascades, and further,

RESOLVED, That the Government be requested to further amend the said Act by increasing the penalty for an infraction of the Act to the sum of \$200 at least, or in the alternative, imprisonment for six months.

That copies of this resolution be forwarded to the members of the Legislature and their co-operation requested."

No official reply beyond a formal acknowledgment has been received to this resolution up to date, but it is to be hoped that the Government has the matter under advisement for amendment at the next session.

I have here a copy of what is known as "The Prairie Fire Ordinance of the Northwest Territories" as now in force in the Provinces of Alberta and Saskatchewan. Here is an Act, which has been drawn up with the evident intention of making it effective, and Sections 2, 4, 6 and 11 should all be incorporated in the Bush Fire Act of the Province of British Columbia, with slight amendments, as to the kind of fire guards required. These sections are as follows:—

"Sec. 2—Any person who shall either directly or indirectly, personally or through any servant, employee or agent—(a) kindle a fire and let it run at large on any land not his own property; (b) Permit any fire to pass from his own land; or (c) Allow any fire under his charge or control, or under the charge, custody or control of any servant, employee or agent to run at large, shall be guilty of an offence and shall on summary conviction thereof be liable to a penalty of not less than \$25 and not more than \$200 and in addition to such penalty shall be liable to civil action for damages at the suit of any person whose property has been injured or destroyed by any such fire."

This Section puts the responsibility where it belongs, and the penalty is not incurred for failing to take precaution, but for causing a fire on any land not his own property and allowing it to run at large irrespective of damage, or for permitting any fire to pass from his own land.

These conditions are only just, and stringent legislation is more necessary in this timbered Province, where the damage done by a bush fire can never be repaired, than on the prairie, where the effect only lasts for one or two seasons.

Section 4 provides for fire guards before starting any fire for guarding property or clearing land, and also for having necessary help at hand, as follows:—

“No person shall directly or indirectly, personally or by any servant, agent or employee kindle on any land a fire for the purpose of guarding property, burning stubble or brush or clearing land, unless the land on which the fire is started is at the time it is started, completely surrounded by a fire guard not less than twenty feet in width consisting of land covered with snow or water or so worn, ploughed, burned over or covered with water as to be free of inflammable matter, and any person kindling a fire for such purpose shall during the whole period of its continuance cause it to be guarded by three adult persons provided with proper appliances for extinguishing prairie fire.

Any person contravening this section shall be guilty of an offence and be liable on summary conviction thereof to a penalty not exceeding \$100.”

Section 6 also provided that even before the 7th of May in each year, a fire guard 10 feet wide, and three adult persons with proper appliances, are required when clearing land not exceeding 320 acres. Note that failure to comply with these provisions renders any person liable to the penalties of the Act, even if the fire does not get away, nor cause damage.

Section 11 is a very important provision, reading: “Any fire guardian may order any grown-up male person under sixty years of age (other than postmasters, railway station agents, members of the medical profession, telegraph operators, conductors, engineers, brakemen, firemen or trainmen) residing or then being within ten miles of a prairie fire or within fifteen miles of a bush fire to proceed at once to the locality of such fire and assist in extinguishing it; and any person neglecting or refusing without lawful excuse to obey any such order shall be guilty of an offence and liable on summary conviction thereof to a penalty not exceeding \$5.”

We require this especially in British Columbia, because the population is scattered, and unless there is some such method of commanding help, many fires throughout the interior of the Province cannot be coped with at all. The resolution of the Mountain Association last February, also asked that deputy fire wardens be given this power, but without effect.

The Mountain Lumbermen would ask this Convention to pass a strong resolution calling for a change in the Legislation regarding Bush Fires, and would recommend the Northwest Provinces Ordinance, for its definition of the responsibilities and penalties, and in addition the system of permits to start fires for clearing land. Besides passing such resolution, we

want every member of the Forestry Association to use every influence he has and keep on agitating for these amendments.

Now about fire ranging. No matter what laws we enact there will be some fires from causes which cannot be controlled, and possibly from carelessness.

At two previous sessions of the Forestry Association, Mr. James Leamy, Dominion Crown Timber Agent for this Province, has been heard from on the subject of the fire ranging system in the Railway Belt in British Columbia.

This Fire Ranging System has been well administered, and has done a great deal of good, and saved vast quantities of valuable timber. With better provincial laws, as discussed just now, and perhaps more fire rangers still, the Railway Belt will be in pretty fair shape. But do not for a moment imagine that this covers the whole Province, or even a considerable part of it. The area of British Columbia is 382,000 square miles according to the school geographies. The Dominion Railway Belt is 40 miles wide, by, say 500 miles long, or about 20,000 square miles—a little more than one-twentieth of the Province—and what is the system of fire ranging in the nineteen-twentieths of the largest province in confederation? There is none. At any rate none worthy of the name.

The Lumber Industry contributes more largely to the revenues of the Province than any other. The direct tax in the way of rentals on timber licences, and the dues on timber cut, together form a very large revenue for the Province. The figures being for 1904, \$416,276.40 and for 1905, \$578,748.02. Yet, will you believe it, for the year 1904 not one dollar was appropriated for protection of this great resource from fire. According to the report for that year of the Chief Commissioner of Lands and Works, only \$13.95 was expended (on extinguishing a fire at Saanich.) For 1905 only \$2,700 was appropriated, and for 1906 only \$5,000.

Of course these figures show an increase from year to year and for that so much credit is due the Government, but how fearfully inadequate is an appropriation of \$5,000 to attempt to finance a system of fire ranging in a Province of 382,000 square miles.

Let us see how this compares with the amount expended by the Dominion Government in their Railway Belt—one-nineteenth the size of the estate the Province has to administer. In 1904 the Dominion expended \$9,773.51, in 1905, \$12,962.86, and in 1906 it is expected the amount will be greater than last year.

It may be advanced in favor of the Provincial Government that money is more plentiful with the Dominion, but what

saw-mill firm or other business enterprise would dare to leave so great an asset without fire protection, and the harder that firm was pressed to finance its undertaking, the greater would be the need of raising some money for fire insurance premiums. That is the way this question of fire ranging should be looked at. It is the greatest asset and source of revenue the Province possesses, but it must be cared for better or the largest proportion of it will be destroyed by fire; as quite a percentage of it has been already.

The Provincial Government has a number of salaried officers scattered throughout the interior. A fairly efficient system could be provided if every Government agent, mining recorder, police constable, and other salaried officer of the Government in the interior, were thoroughly awakened to the importance of fire ranging, and if one general fire warden were appointed permanently to formulate the plan of campaign, draw up instructions, get reports, and supervise the work of the officers so far as fire protection is concerned, and if, in addition two salaried fire rangers were out in each district during the five summer months, and authority given to put on extra men during the extremely dry spells. Every one of these appointments should be kept entirely clear of party politics. There are good men available in almost every district, if they are selected on their merits, and ordered to fearlessly carry out the law as we hope it will shortly be amended.

Besides these rangers every lumber concern has bush superintendents, foremen, and others who would willingly give valuable services without remuneration if given the authority; and an Act that is effective; and if they knew an honest attempt was being made to enforce it.

Now as to what are timber lands, and what are agricultural—the present legal definition calls land, which contains 5,000 feet or over of merchantable standing timber per acre, "Timber land," east of the Cascades.

But there is nothing in the Land Act that I can find to prevent anyone from pre-empting timber lands for agricultural purposes, and burning the timber off it as fast as he can.

The act does contain a provision that timber lands cannot be sold; then why should pre-emptions be allowed?

There is also nothing in the law, or practice of the Department, to prevent the homesteading or sale of small patches of land in the midst of large areas of valuable timber; or of lands, which are covered by young, growing timber, which, while it may not at the moment, amount to the statutory 5,000 feet per acre, will in the course of a few years, if saved from fire, amount to far more.

First of all, timber lands, which can be classed as timber lands under the Act, should be reserved from pre-emption.

Then an examination should be made as rapidly as possible of all the interior valleys, and those which are better suited for a source of timber supply, present and future, should be reserved for that purpose, and the homesteader and squatter with the fire that follows in his wake, should not be allowed. There are squatters all over the interior who are located on land on which they can never make a decent living, which would be a valuable asset for its timber in the near future, if kept as a forest reserve.

In connection with any examination and selection of lands, particular care ought to be exercised in connection with those places, where timber not now large enough for saw logs is growing, and where the conditions are such that it will continue to do well if protected from destruction.

It is in order that this be carried out without too much friction that we need a campaign of education in this Province on the objects and benefits of Forestry principles.

Next to fire, the greatest enemy to the proper management of the forest resources of this Province, is the manner in which they are administered, particularly in the way of the title given to timber licenses, and the rentals charged.

The present regulations would seem to have been invented for the purpose of forcing the clearing of each limit as rapidly as possible, in order that it may be abandoned at the earliest date.

Practically all the timber land in the interior outside of the Dominion Belt and lands given to railways, is held under special license. Each special license consists of not more than 640 acres and for this an annual rental of \$115 is charged, in addition to the dues of 50 cents per thousand, when the timber is cut.

All special licenses which were in force prior to April, 1905, were allowed, at the holder's option to be brought under a special regulation, by which they were made renewable for sixteen consecutive years, at the same rental, \$11 per mile per annum, in consideration of which the dues were increased to 60 cents per thousand feet. All special licenses after that date are renewable for 21 years at such rate of rentals and dues as may from time to time be fixed.

In neither case is there any provision whatever for renewal after the expiration of the 16 or 21 years period, as the case may be.

Now the natural result of the very high rental, the uncertainty of tenure, and the possibility of a sharp increase in the rental of the 21-year licenses at any time the Government needed money—is that the timber must be cut as quickly as possible. No operator can afford to hold it to give the thrifty young timber a chance to come to maturity, and, therefore, the timber marketable at the present time is cut off, the limit is thrown up, and sooner or later the fire gets the timber that has been left standing, and which under conservative management, would have become more valuable to the holder and to the Government, than that which has been logged.

In the first place there should be a regulation that these licences will be renewable from year to year so long as merchantable timber remains thereon, coupled if necessary with a regulation requiring holders of more than a limited number of licenses to manufacture a certain proportion.

Then there should be some kind of a graduated scale of rentals. I do not suggest an immediate reduction of the rental, because, the Government of the Province must have money; they want it for fire ranging, if for nothing else—but suppose for the first five years, a rental of \$125 per sq. mile were collected; for the next five years, if the holder had erected a mill, and was manufacturing a reasonable amount of lumber, and was holding these licenses to give a permanence to his operations, let the rental be fixed at \$50 per annum; for the third five years, reduce the rental to \$25 and continue that rate thereafter, so long as timber remains and a saw-mill is operated. By this scale each mile of timber would produce \$1,000 for the Government in rentals during the first fifteen years, and a revenue of \$25 per annum after that period.

Lumbermen in the interior, who now contribute much the larger half of the special license fees of the Province, under some such plan as here outlined, would add to their holdings, the Government would get a greater revenue for the next few years, more timber would be taken up, and once taken up, there would be the owners in addition to the fire rangers we hope to have appointed, to assist in protecting it against Fire, a greater permanence would be given to lumbering operations, and better than all else, from a Forestry point of view, the mill men or loggers would be able to so plan and carry out their cutting as to conserve the Forest resources of the country— young growing timber would become a valuable asset to the country instead of being neglected and allowed to be destroyed.

THE TIMBER ALONG THE PROPOSED LINE OF THE HUDSON BAY RAILWAY.

During the summer of 1906 Mr. William McInnis of the Geological Survey Staff explored the country which lies between the Pas on the lower Saskatchewan and Split Lake where the Nelson River approaches most closely to the head-waters of the Little Churchill and his preliminary report which makes part of the recently issued Summary Report of the Geological Survey Department contains much information on the forests through which the proposed railway to Hudson Bay will run. Writing of the country generally Mr. McInnis says:—"Though a wooded country throughout there are but limited areas where the forest growth is of a size to be commercially of much value. There are no hard woods, the only deciduous trees that attain merchantable measurement being the canoe birch (*Betula papyrifera*), the aspen and balsam poplars (*Populus tremuloides* and *P. balsamea*) and the tamarack (*Larix Americana*). Black spruce (*Picea nigra*) is the most abundant coniferous tree and grows to a size sufficient, at least, for pulpwood. Associated with tamarack, it covers all the more marshy tracts, giving way, where the land becomes dryer, to white spruce, (*Picea alba*), which is the timber tree of the region, and, on the dryest ridges, to Banksian pine.

Forest fires have been wide-spread and most destructive throughout the whole region, sparing only the very wet, muskeg areas and a few tracts isolated by surrounding water or marsh. In some places on the uplands the charred stumps were seen to indicate the passage of two successive fires at intervals of about forty years. Most of the fires seem to have been due to carelessness on the part of native travellers, for violent storms with lightning are not of frequent occurrence and during the whole summer but one trunk was noticed that had been shattered by lightning.

Over the whole region the areas of forest, where the trunks are large enough to be of commercial value, are limited, though, but for recurring fires in the past there would be a magnificent forest cover over the whole area, stunted only on the muskegs and in the Archaean and limestone areas and on the hill tops where the soil is wanting or too thin to support a good growth. The principal tracts of large, standing timber are situated to the north of Moose lake, to the west of Atikameg, in the lower Grass River valley and on the ridge separating Cormorant and

Yawningstone lakes. The last named tract contains white spruce of exceptionally large size with tall clear trunks. Smaller areas are found on islands and points in the various lakes, along the upper valley of the Cowan river and, in clumps, along all the stream valleys in the district. Smaller timber, mainly black spruce, that would be of value for pulpwood, is much more widely distributed over large areas.

Over part of the Archaean area the white spruces were suffering from the attacks of fungi that infested the leaves, causing them to turn red and white as though firekilled.* This fungus which Professor Macoun has ascertained to be *Peridermium decolorans* was found only on the white spruces, though it does not generally confine its attention to any one species of spruce. The injury to the trees will probably not be permanent, resulting only in most cases in a slight retardation of the growth.

A table is appended giving the comparative ages of trees throughout the region at various ages.

AGES OF TREES.

Spruce, 4 inches in diameter, 3 ft. from ground, Burntwood river.....	Yrs. 35
Spruce, 7 inches in diameter, 3 ft. from ground, Burntwood river.....	85
Spruce, 5 inches in diameter, 3 ft. from ground, File lake.....	58
“ 44 “ “ File lake.....	52
Banksian pine, 6 inches in diameter, 3 ft. from ground, File lake.....	58
Banksian pine, 10 inches in diameter, 3 ft. from ground, Sand plain, north of Reed lake.....	95
White spruce, 12 inches in diameter, 3 ft. from ground, Clay flat, below Wekusko lake, Grass river.....	85
Aspen poplar, 12 inches in diameter, 3 ft. from ground, Clay flat, below Wekusko lake, Grass river.....	110
White spruce, 12 inches in diameter, 3ft. from ground, below Reed lake, Grass river.....	108
White spruce, 14 inches in diameter, 3 ft. from ground, Cowan river, near bank.....	153
White spruce, 8 inches in diameter, 3 ft. from ground, Cowan river, 2 chs. back.....	155
White spruce, 7 inches in diameter, 3ft. from ground, south of Yawningstone lake.....	156
White spruce, 11 inches in diameter, 3 ft. from ground, south of Yawningstone lake (trees still growing at good rate.).....	160

*Vide Forestry Journal for October, 1906.



Young conifers at Indian Head.



Cottonwood logs referred to on opposite page.

The ages of the trees given in the table above were computed by counting the rings of annual growth and adding from five to eight years for the earlier life of the tree before reaching the height where the rings were counted. It will be noted, that in all cases the trees are of comparatively small diameters for their ages, or, in other words, that the annual growth is small.

They would furnish, therefore, very firm and strong lumber and the smaller trees, owing to their closely packed fibres and the comparative absence of open, cellular matter, would be especially well adapted for the manufacture of wood pulp for paper making."

In the last issue of the *Forestry Journal* Mr. Norman Ross referred to the Cottonwoods which were planted at Indian Head in 1903 and which had to be cut out last fall. One of the photos on the opposite page shows this wood after it was piled up in order to show clearly the character of the wood obtained in four years' growth. The pile is four feet high and the poles about $9\frac{1}{2}$ feet long. The largest would measure six inches in diameter at the ground line. In order to give some idea of the rapid growth of the Cottonwood (*Populus deltoides*) Mr. Ross sends the following extract from a statement made by Mr. Geo. H. Whiting of Yankton, North Dakota. "48,000 feet, board measure of lumber, 30 cords of 4 ft. wood and several loads of stove wood were cut from a ten-acre grove on the Whiting Nursery farm last winter (merely thinnings) and a good stand still remains. This grove stands on land that was hay meadow up to the year 1881, when the Missouri River flood overflowed it and started the little seedlings from which the trees grow without cultivation or care other than the annual thinnings for stove wood, posts, poles, etc., which had yielded a nice little income every year since 1890."

The second photo shows a portion of a plantation set out on the Nursery Station at Indian Head last spring (1906). It consists of alternate rows of native white spruce and Scotch pine set in rows 3 feet apart with about 4 feet between the plants in the row. The young trees were 4 and 5 years old, once transplanted, and were all raised from seed at Indian Head. This plantation is to form part of the permanent shelter belt on the north boundary of the nursery.

THE FORESTS OF TRAVANCORE.

BY J. O. SURRAO, TANGASSERI, QUILON-TRAVANCORE,
BRITISH INDIA.

The Native State of Travancore, otherwise called the "Model State," since the days of Raja Sir T. Madhava Row, one of Travancore's ablest ministers, lying to the south of the Madras Presidency and forming one of the most important of the Native States of British India, has been long known as 'a country of forests,' inasmuch as out of a total area of over 7,000 sq. miles, no less than (*) one half comes under the category of forest area, at the present day, in spite of the pressure of population and the reckless felling of timbers and clearing of land for cultivation that have been going on, regardless of consequences, for hundreds of years past. Compared with other countries this forest area is very great indeed, for, we find that Belgium and France have only about 17% of their whole area as forests, Switzerland and Germany have but 20%, Spain and Italy about 13 and 14%, mountainous Greece has only 13%, while Turkey is no better than Greece in reference to her forest area. Finland, however, has 60% under forests while Sweden and Canada have 40 and 38% respectively. "The whole country," say Ward and Conner in their memoir of the Travancore Survey, "presents a ground of green, and is for a considerable part of the year, from the abundance of moisture, covered with a rich verdure, but it is too woody to admit of much extent of pasturage." "Nature," says Mr. Bourdillon, F.L.S., in his *Report on the Travancore Forests*, "has fitted it for the production of vegetation of all kinds by the character of its climate, by the warmth of its atmosphere and by the almost perennial moisture which prevails." Speaking again of this perennial moisture, Mr. Bourdillon in paragraph 80 of the above Report says, "Probably nowhere in the world are the conditions of growth so favourable as in Travancore and consequently we find the ground completely covered with trees or shrubs wherever it is not cleared for cultivation." A country such as this, is naturally expected to have a great wealth latent underneath the canopy of its ample and varied foliage and it would be interesting to many, and to forest officers especially, to get an insight into the past history and the present management of the forests of this woody country.

* Mr. Bourdillon's Report on the Travancore Forests, page 14.

EARLY HISTORY.

Travancore, in its oldest days, had but a narrow strip of land along the sea coast inhabited and, perhaps, in addition a few villages dragged on a struggling existence by the banks of some of its principal rivers. A number of petty chiefs held sway over the different tracts of the country and these were not infrequently at warfare with each other, (*) so much so that little or no progress worth the name was made in arts or civilization. It was with the dawn of the 19th century that comparative peace was restored in the land, and with this the people began to enjoy security and to devote themselves to art and industries, thereby creating by degrees, amongst other things, a demand for timber.

Unlike European forests, with but 3 or 4 principal trees and about half a dozen of the rarer species to constitute its flora, the Travancore forests enjoy the unique distinction of having over a hundred different species of trees to constitute its flora, chief among which are Black-wood or Eeti (*Dalbergia latifolia*) Teak or *Thekku* (*Tectona grandis*) *Thumbagom* (*Hopea parviflora*) *Anjili* (*Artocarpus hirsuta*) *Thembavu* (*Terminalia tomentosa*) Sandal wood or *Santhanom* (*Santalum album*) *Veigai* (*Pterocarpus marsupium*) *Irul* (*Xylia dolabrifornus*).

EXTRACTION OR TRANSPORT OF TIMBER.

Although Travancore has such a varied growth of timber trees most of which are commercially valuable and very adaptable for building and other purposes, there was a requisition for Teak alone in the days when the demand for timber originally sprang up.

The primitive method adopted in Travancore for the extraction of timber from the forests was, we gather from Lieuts. Ward and Conner, who were engaged in the survey of the country from 1816 to 1820, by leasing out such of the rivers as could be utilised for floating timber to each contractor at a certain rate of fee for each river. This arrangement in all probability gave the contractor freedom in the choice of the species he cut and the locality from where he worked them down. Later on, Government seems to have arranged for the working down of timber on their own account and the timber thus extracted was collected at the Commercial Agent's Office at Alleppey—the principal seaport of Travancore—and was sold there by that officer who, at that time, in addition to being the Commercial Agent, was probably Conservator of Forests as well. Subse-

* See Major Heber Drury's "Letters from Malabar" to which is added an account of Travancore and Fra. Bartholomeo's travels in that country, page 168 foot note.

quently this dual charge was abolished and the two offices were separated and one Mr. Munro was appointed first Conservator of Forests(*) with a staff under him of 103 men for forest work, and 126 for collection of cardamoms. Gradually and by degrees this staff had been so strengthened, that at the present day the Forest Department is manned by a staff consisting of over 350 permanent and 250 temporary hands, besides over 200 special hands, engaged for different purposes during parts of the year. So that not only can the working down of timber by consumers and purchasers be controlled, but it also affords facility for the extraction of timber by Departmental agency, both of which systems prevail at present.

Until a few years ago, in addition to timber being worked down by contractors for the Government Depots, the people were allowed to enter the forests and fell and remove, on the "Permit System," what timber they required, on payment of the fixed rates of *Kuttikanem* (seigniorage), which varied according to the kind of timber required to be felled. This "Permit System," though it afforded convenience to the people to meet their timber wants, had its disadvantages as well, chief among which was the scope it gave to speculative tradesmen, with dishonest tendencies, to smuggle large quantities of timber with little fear of detection. Another drawback was that it led to reckless and indiscriminate felling, the continuance of which would have seriously affected Forest interests, and thereby indirectly, the welfare of the people. This system was therefore abolished about 5 years ago, and with its abolition the death knell of many a smuggling marauder reverberated amongst the timber clad hills of Travancore.

The timber that is worked down, both by Departmental agency and by contractors, is felled and left in the forests for a time to dry and is then collected at a spot, stamped and registered by the respective Range Forest Officers and then conveyed under proper transport passes to the river or road-sides by elephants or coolies hired for the purpose. From here the timber is either floated or carted down to the water and land depots, respectively, and there sold either at periodical auctions or at daily sales. The floating of timber is done by tying up the logs in rafts of 4 and 5 which are poled or dragged by men when the current is not strong enough to send them down the river. In the case of the heavier species, the rafts are interlaced with a number of bamboos (*Bambusa arundinacea*), which, by the way, is abundant in the Travancore Forests, to make them more buoyant.!

* Mr. Bourdillon's Report on Travancore Forests, page 159.

For purposes of extraction and transport of timber, no improved appliances similar to those common in countries where Forestry has attained an advanced stage, such as timber-slides or tramways, have been introduced in the Forests. A valuation survey, the first of its kind in Travancore, is being made at present of one of the largest Forest Reserves of the State, to determine whether it would be a financial success to open a tramway to connect it with the South Indian Railway for facility of transport of timber.

CONSERVATION OF FORESTS.

Originally, it was a popular opinion that the forests would reproduce themselves, and that it would be superfluous to bestow any care upon them in the direction of conservancy and regulation fellings, and consequently there was no restriction whatever placed in the matter of removal of timber or clearing of land for cultivation or the grazing of cattle. That such a system was erroneous in principle and disastrous to the welfare of the people, as it affected climatic conditions and forest improvement, was eventually realised and we see that the first attempt towards forest reservation was made in the year 1888. Speaking of the alienation of public forest lands, Arthur P. Davis in a paper on "Suggestion for forest policy" published in "*Forestry and Irrigation*" for January, 1906, says, "Every acre of forest land in public ownership should be included in a Forest Reserve and a scientific control exercised over the grazing and cutting thereon," and again "Private lands bearing forest should be added to these reserves as fast as practicable and they should be made nuclei for forest extension by planting and cultivation. The Travancore Forest Regulation II of 1068 M.E. †, (1892-1893) enunciates the procedure to be followed in the settlement of Forest tracts and it greatly helped this all-important work, and we find that at the end of the last official year, 1080, there were under the control of the Forest and Cardamon Departments, 2245 sq. miles, 416 acres of Reserved Forests and 192 sq. miles, 190 acres of Reserved lands.* When once this work of settlement is completed and all available forest lands brought under the category of Reserved Forests, and valuation surveys are made, it will be feasible to work the Travancore Forests on the more systematic basis of Proper Working Plans, in the place of which for want of a scientific survey of the forests, they have only a system of Preliminary Working Plans, which but roughly indicate the area wherein felling operations are to be located, without

† M.E. stands for Malabar Era which began from August, 824 A.D.

* Report on the Administration of Travancore for 1080 M.E., 1904 to 1905 A.D.

reference, we presume, to the actual yield or outturn of the 'compartments' operated upon. With regard to the forests within lands in the enjoyment of private chiefs and other owners, steps are being taken to take over such areas from them and to bring them under a systematic method of treatment and control of the Department.

YIELD AND WORKING.

Timber brings in the largest revenue to the Department the total receipts under this head alone being very near 5 to 6 lacs of Rs. on an average for the last five years. The income derived from Minor Forest Produce has been till now very small in proportion to the capacity of the forests. But as more information is being gained of these products year by year the proceeds declare an annual increase. The forests, if thoroughly studied, would unlock a profitable opening in this direction. Not only is the knowledge gained of these products limited, but that limited knowledge is not, we fear, being worked out to the best advantage. Barring timber, one of the items that contributes to swell the coffers of the Forest Treasury is from the capture of wild elephants.

ELEPHANT CAPTURING.

Yearly numbers of these animals are captured in pits and the method adopted is comparatively an easy one. The tracks frequented by these wild denizens of the forests are ascertained, and pits 12 ft. in diameter at the top and 9 ft. diameter at the bottom, with a depth of 12 ft. are dug along such tracks in groups of three thus, O^{O} . A layer of grass, leaves, etc., is deposited at the bottom of the pit to break the fall of the captive and the top is covered with cross twigs, leaves, grass and sand to conceal the existence of the pit. When a "fall" has been reported the forest officer with decoy elephants and coolies repair to the spot to release the "captive." In a short time a noosed cord is passed round the neck of the animal and three attached cords that branch off from this, are taken up by 'decoy' elephants—one in front and the other two on either side of the captive. Another cord is noosed round one of the hind legs and taken up either by a fourth decoy, if there be one, or, in its absence, by a number of coolies. As soon as everything is ready, twigs and branches are thrown into the pit to assist the animal to 'clear' the pit and then the captive is marched off to the "Kraal" (wooden cage), where under the tuition of expert mahouts the animal is trained in 3 or 4 months time. Mr. Bourdillon in his Report on the Travancore forests says, "Lieut. Arthur in his Memoir of Travancore, written in 1810, mentions that at that time the Government used to

allow people to cut pits for these animals on payment of a tax per pit. The elephants thus taken, apparently became the property of the person who dug the pit." This arrangement accounts for the very large number of pits which are reported to be seen in different parts of the forests and even in remote and out of the way places. This original method of capturing elephants in pits was condemned because it resulted in a number of casualties, the causes therefor being latterly found out to be the want of sufficient bedding at the bottom of pits to break the 'fall,' and the non-appointment of a sufficient number of pit watchers to give timely intimation of captures. The experiment of capturing elephants by the "Keddah" system on the line of the plan of Mr. Sanderson's Keddah in Mysore, was tried for some years from 1052 M.E. (1876-7), but it had to be given up as it did not prove successful—the causes being (1) the difficulty of training the old animals caught along with the others, (2) the herds of elephants in Travancore being small in numbers, and (3) because as years passed by the wild elephants knew of the location of the Keddah. Even in the sister State of Mysore, where extensive captures are made yearly, the Keddah system was found to be a failure financially.

Re-AFFORESTATION.

In concluding a series of articles on the "Insufficiency of the World's timber supply," in the issues of the *Indian Forester* for the year 1901, Mr. F. Gleadow predicts that a timber famine would "begin ere fifty years are past" and suggests remedies for counteracting the effects of such a catastrophe and suggests re-forestation as one of the ways to mitigate it.

The first attempt at re-afforestation in Travancore was made in 1866 or 1867, when a small area of about a hundred acres was planted with Teak, and ever since then additions are yearly made to these plantations and we find that at the end of the last official year there were no less than 2763 acres under regular plantations the majority of them being planted with Teak and a small percentage with *Thambagom* (*Hopea parviflora*) Rubber (*Hevea Brasiliensis*) and Casuarina (*Casuarina equisetifolia*). The system of planting adopted for Teak is as follows. Plots of forest land in the vicinity of roads or rivers are selected, the timber thereon is felled and the land cleared, lined and holed and plants raised from nurseries, previously prepared, are put out at a distance of 6 ft. x 6 ft. Over and above these plantations, which are under the direct management of the Department, large tracts of land are also given out to private men for temporary cultivation of cereals for a year or two, provided they hand

* See page 163 Report on Forests of Travancore.

them over to the Department, at the expiry of the term, fully planted with Teak or other species as may have been agreed upon. Broadcast sowing of seeds of valuable species is also in vogue; besides this, selected patches of forests containing timber of the royal or reserved species are carefully fireprotected, and by means of creeper-cutting and other cultural treatment, the growth of the 'stand' is promoted. It is gratifying to note that owing to the exceptional climate of the country and its favourable temperature, the endeavours of the forest authorities to aid natural, and create artificial, reproduction, are invariably well repaid from a forester's point of view.

THE HILL TRIBES.

No account of the Forests of Travancore would be sufficiently interesting, without, at least, a short description of the different tribes of hillmen that inhabit them. They number about eight to ten thousand, and though divided into 12 or 14 tribes, who do not countenance intermarriage between each other, they are supposed to have originally sprung from 2 or 3 sources, as evidenced from the similarity of color and the comparative agreement of features of certain sects. The "*Kanies*" of South Travancore; the "*Palliyars*," the "*Malayadayar*," the "*Hill Pandarans*," the "*Kochivalans*" and "*Ulladans*" of central Travancore; the "*Arayans*," the "*Vishavans*," the "*Uralies*," the "*Palliyars*," the "*Mannans*," and "*Muthuvans*" of North Travancore are the chief tribes. Of these the "*Kanies*" and "*Arayans*" are the strongest in numbers, their total number being 2000 and 4000 respectively. The "*Uralies*," the "*Mannans*" and "*Muthuvans*" come next with a strength varying from 700 to 800 each. The other tribes are comparatively few in number, their strength being below 200, in the case of the "*Palliyars*" of the North, and below 100 in the case of all others. Most of the tribes are dark skinned, with short noses, thick lips and African features, and speak "*Malayalam*"—the mother tongue of the country as a rule—but a few of the tribes speak a language more affiliated to Tamil than Malayalam. These latter are supposed to have immigrated from the adjoining Tamil countries of Southern India. The "*Muthuvans*" are tall and have aquiline noses, and the best features of all the tribes. As a rule the hillmen are, from the abundance of food they take and the life of independence and health they lead, well built, strong and muscular. The majority of them live by means of cultivation, that appealing most to them being "*shifting cultivation*," which has spelt ruin to many a noble forest tract. They grow grains, yams and vegetables and very often have a good supply of these for their support. They eat fish and flesh as well. They smoke tobacco

and bhang and are generally fond of opium. It is very difficult to form any correct idea of their religious tendencies. Instead of worshipping any Deity whom they trust to help, protect and love, they are generally found to be engaged in propitiating the wrath of some unknown Demon, whom they think to be always on the alert to injure them. Religion such as this, would be irksome, and as the hillmen, unfortunately, always prefer to live away from places where civilization could find its way, there is not the remotest chance of their being able to taste at least the elements of any religion that soothes, instead of worries, or, that strengthens, instead of intimidates. So peculiar are the ways of these hillmen, and so out of the common run are their habits, methods of living and social conceptions, that it would afford special interest to readers, if the subject be dealt with in detail in a separate account.

According to the Agricultural Returns, the total area of woodlands in Great Britain now amounts to 2,768,243 acres, of which 1,715,473 acres are in England alone. There has been an increase of about 50,000 acres in England during the past ten years. In Scotland, on the other hand, there has been a decrease of about 10,000 acres during the same period.

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