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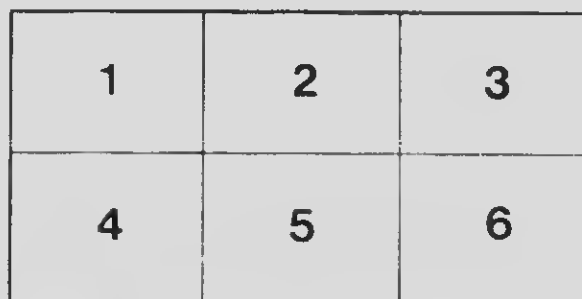
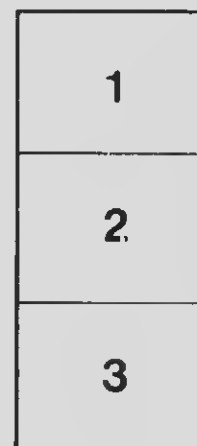
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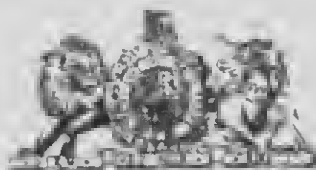
NEW BRUNSWICK
FORESTRY
CONVENTION

Held at

FREDERICTON, N. B.

February 21st and 22nd

1907





MOUNT ALLISON UNIVERSITY

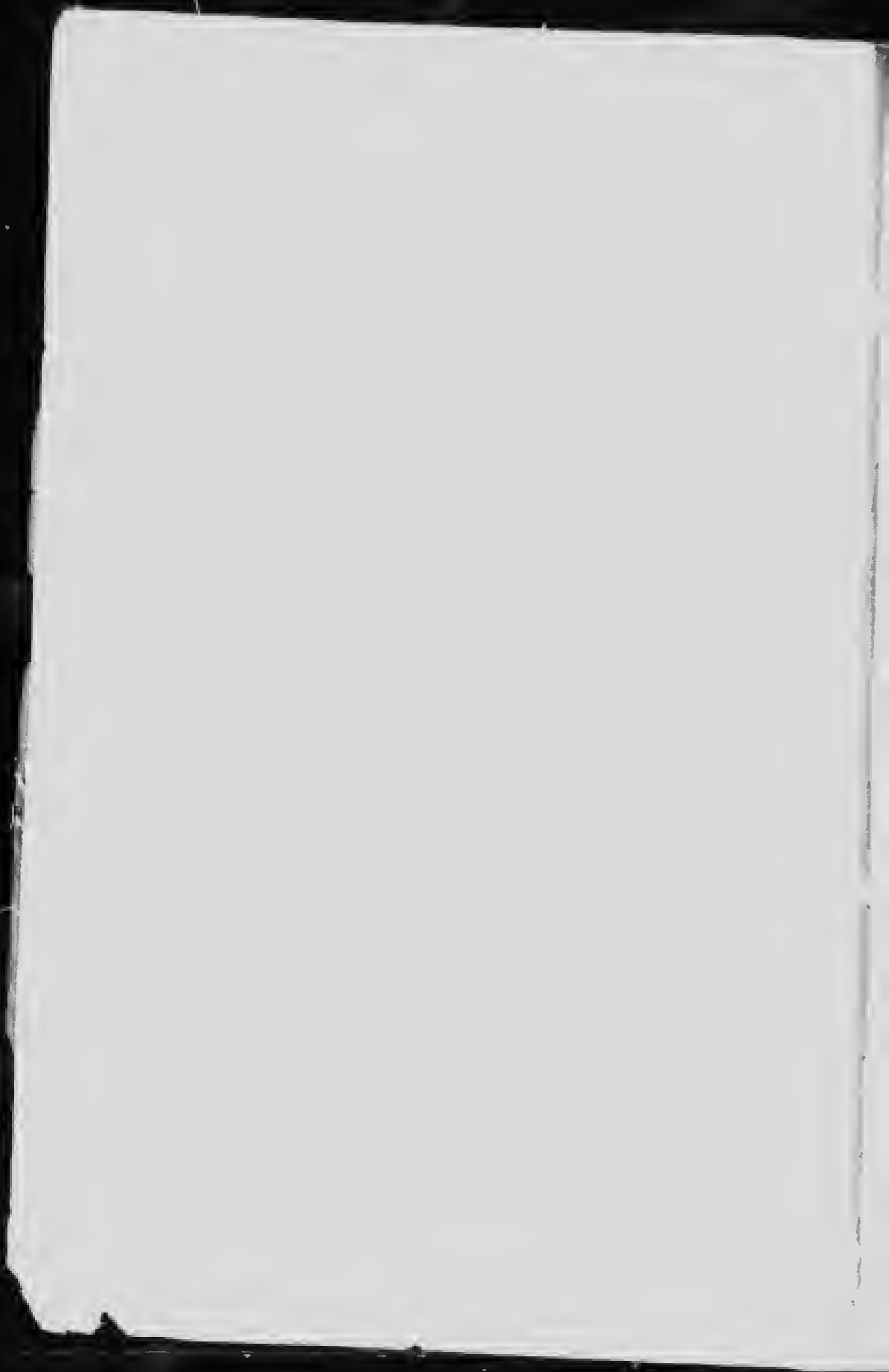


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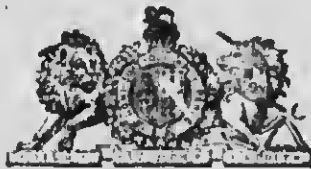


NEW BRUNSWICK
Forestry Convention

HELD AT

FREDERICTON, N. B.

February 21st and 22nd



1907

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FORESTRY CONVENTION

Held at Fredericton, N. B., February 20th and 21st, 1907

Under date 14th Jan., 1907, the Hon. L. J. Tweedie, Premier of New Brunswick, issued the following citation:

PROVINCE OF NEW BRUNSWICK

Forestry Convention, Fredericton, N. B., Wednesday, 20th and Thursday, 21st February, 1907

By virtue of the Provisions of an Act passed by the Legislative Assembly of New Brunswick at its last Session, entitled "An Act for the better preserving and protection of the Public Domain," the Lieutenant-Governor-in-Council was authorized to summon a Forestry Convention during the present year, to be held in the City of Fredericton, at which all persons interested in the Protection of the Forests or science of Forestry should be publicly invited to attend.

An Order in Council having been passed for the calling of such Convention, I have much pleasure on behalf of the Lieutenant-Governor-in-Council in extending to you a cordial invitation to be present at said Convention, which will sit at Fredericton on Wednesday the twentieth and Thursday the twenty-first of February next, and trust you may find it convenient to attend.

Special rates for transportation of those attending the Convention will be arranged with the I. C. and C. P. Railways.

A programme of the procedure and names of the principal speakers will be furnished at the opening of convention.

The following subjects will be discussed;

NEW BRUNSWICK FORESTRY CONVENTION

1. The general need of Forest Preservation.
2. Attitude of Educational Institutions towards Forestry.
3. Dependence of business interests on Forests.
4. The Lumbermen's interest in Preservation of Forests.
5. The development of water power as related to Forests.
6. The Forest policy of the United States and other Countries.
7. Addresses upon the subjects relating to Forestry protection embodied in the Public Domain Act.

If you have any suggestions to offer on any of the subjects above outlined, you will kindly communicate with the undersigned.

A copy of the Public Domain Act is herewith enclosed.

I have the honor to remain,

Your Obedient Servant

L. J. TWEEEDIE,
Premier of New Brunswick

Fredericton, N. B.

14th January, 1907.

An early answer is requested to
W. F. FLEWELLING, Deputy Surveyor General,
Fredericton, N. B.

LEGISLATIVE ASSEMBLY ROOM,
Fredericton, N. B.,
29th Feb., 1907.

In response to the foregoing invitation a large number of persons interested in Forestry attended at the Assembly Rooms.

MORNING SESSION, WEDNESDAY, FEBRUARY 20TH.

At 11.19 o'clock a. m. His Honor the Hon. Mr. Benjamin Snowball, Lieutenant Governor of New Brunswick, called the meeting to order and made a few well chosen remarks, closing by calling upon the Hon. L. J. Tweedie, Premier of New Brunswick, who made the following

ADDRESS OF WELCOME.

Your Honour, Ladies and Gentlemen: It affords me a great deal of pleasure indeed to extend a most cordial and hearty welcome to all who have come to visit us today and take part in the proceedings of the first Forestry Convention that has ever been held in the Province of New Brunswick. It is never too late to learn, and it has been long in for some time on the Government that it is necessary in the interests of this Province that we should amend our policy in regard to the great lumber industry of this Province, which is one of the greatest industries we have, our oldest one, indeed, and therefore last winter we introduced legislation, whereby the Government was authorized to adopt certain measures which we considered would be in the interests of the Province. For many years the lumber industry of this Province and the Forests were allowed to look after themselves. No great care was given to their protection, and the consequence is that the Province has been depleted of millions of dollars worth of valuable lumber; but, as I have said, it is never too late to learn, and we have at length arrived at the conclusion that some new measures must be taken to protect this great industry. Therefore, feeling that it would be wise on the part of the Government to have the opinion of experts on this important question, not only from our own Province and from the Dominion, but from all over the continent, we were authorized by law to hold a Forestry Convention and to invite the public to attend. We have invited gentlemen from the United States, from the Dominion of Canada and from other Provinces of the Dominion, and I am pleased to extend to those gentlemen who have found it convenient to attend at this season of the year, a most cordial welcome on behalf of the Province of New Brunswick. I regret that some of the gentlemen who were invited, principally from the United States, have been unable to attend. Among these is Mr. Pinchet, the Chief of the Forestry Service of the United States at Washington, whose regrets will be read. He expresses much sorrow at not being able to attend, but as Congress is sitting, he is unable to be here, and we are obliged to do without the benefit of his great knowledge on Forest protection.

I have prepared a short paper on the past history of the Lumber Industry of the Province, which I will now read. I may say that in carrying on the work of this Convention, it is our desire that the addresses should not be of inordinate length, and after each address it is open to any gentleman present to open up a discussion on the matters spoken of in the address. I think it has been found in other Forestry Conventions, notably the one at Ottawa,

that it would be advisable in the future not to have so many speeches, but more general discussion by the persons present as to the subjects upon which papers have been read, and therefore, I trust that no gentleman, although his name does not appear upon the programme, will feel that he has to be a silent listener. If a particular view strikes any gentleman present, he is at perfect liberty to enter upon a discussion and ask any questions he may wish to ask.

Lumber always has been and for a long time must continue to be the principal source of our export trade. Indeed if the hopes of those who are promoting the Forestry Convention are realized, lumber will never cease to be a large source of revenue to New Brunswick. Nearly the whole of our territory was at one time covered with magnificent forests and this attracted the attention of the French Government which required large pine trees for the masts of its navy. More than two hundred years ago masts were being sent from the St. John River to France for the use of the French navy, and when the country came into the possession of the English the same business was continued on a still larger scale and the ships that carried the Flag of England all over the world and which fought at Camperdown, the Nile, and Trafalgar, were supplied with masts and spars from the forests of New Brunswick. For many years after the foundation of the Province large areas of territory in this Province were held as Crown reserves for the supplying of masts to the navy and many complaints arose in consequence from persons engaged in the lumbering industry who maintained that many of these reserves were improperly closed to the lumberman and the settler.

The lumber trade of this Province was at first confined to the export of pine timber to Great Britain and this trade grew to large proportions after the close of the Napoleonic Wars. As the Crown Lands of the Province were under the control of the British Government until the year 1836, we have no statistics available of the export or production of lumber during the early part of the nineteenth century.

The Customs House was also under the control of the British Government, but in 1821 during the Session of the Legislature a motion was carried in the House of Assembly for an address to the Lieutenant Governor, praying that he would be pleased to order to be laid before the House, an account of all goods, wares and merchandise, imported and exported at the different ports of this Province during the past year. At that time there was but one port in New Brunswick, that of St. John (Miramichi, St. Andrew's and

the other ports being merely out-ports). The Government sent in the returns for the years 1819 and 1820 and from this it appears that in 1819, 247,394 tons of Pine Timber were exported from the Province, 26,545,000 feet of Pine Boards and Plank, 6,616,000 Shingles, 5,850,000 Staves, 6,323 Masts and Spars, 6,099 cords of lath wood and 19,890 Hoghead shooks. In 1820, 207,899 tons of Pine Timber were exported, 29,970,000 feet of Boards and Plank, 11,682,000 Shingles, 8,001 Masts and Spars, 5,039 cords of lath wood and 6,387,000 Staves.

In the year before the great Miramichi fire the export of Pine Timber from the Province was 321,211 tons. Of this 141,384 tons went from Miramichi, 114,116 tons from St. John, 25,975 from St. Andrew's and 24,269 from Richibucto. In the same year 5,992 Masts and Spars were exported, of which 1,918 went from St. John and 1,559 from Miramichi. The exports of Boards and Plank amounted to 21,383,000 feet, more than half of which went from St. John, 6,471 cords of lath wood were exported, of which 3,080 cords went from Miramichi and 1,435 from St. John. It will be seen from these figures that at that period the exports of lumber from Miramichi exceeded that from St. John.

In 1825, the year of the great Miramichi fire, exports of Pine Timber from New Brunswick reached the very large total of 416,105 tons, of which 175,000 went from St. John and 158,000 from Miramichi. The export from Miramichi would have been larger but for the fire which took place in October and burned many of the vessels that were in the port for the purpose of carrying away timber, as well as the timber itself. That was a period of wild speculation in Great Britain and also in New Brunswick, which was followed by a period of reaction, and a financial panic which ruined many people on both sides of the Atlantic.

In 1826 the export of timber from the Province fell to 283,000 tons, a result that probably was due as much to the commercial panic of that period as to the destruction of the North Shore Forests by the great fire.

In 1830 the exports of Pine Timber from the port of St. John, which then included Miramichi, but not St. Andrews, amounted to 190,000 tons and in 1831 to 232,500 tons.

In 1832, the export of Pine Timber from St. John and out-ports was 187,000 and for 1833, 208,000 tons. It will be seen from these figures that the Pine Timber trade was already beginning to decline.

In 1819, the export of Pine Timber from St. John and the North Shore ports amounted to 261,118 tons, of which St. John contributed 199,526 tons, Miramichi 68,212 and Dalhousie 15,639 tons. By this time the Deal trade had begun to assume considerable proportions. The first Spruce Deal ever made in New Brunswick was got in the year 1819, and the first cargo of deals, which consisted of only 100,000 superficial feet, was shipped to England in the year 1822. In the year 1846, 79,381,000 feet of deals were shipped from St. John and the North Shore ports, of which St. John contributed 18,755,000 feet and Miramichi 19,078,000 feet.

Ten years later or in 1856, St. John and the North Shore ports, which were then included in the same Customs District, exported 1,468,219 tons of timber, which was a heavy decline from the figures of 1819. The Customs House returns as published do not show how much each port contributed to this total. In the meantime the deal trade had greatly increased, for the export of Spruce deals in 1859, which a total of 127,120,000 or 21,901,000 feet of Boards were also exported from the ports of St. John and out ports.

In 1860 the export of Pine Timber from New Brunswick had fallen to 39,294 tons, but the export of Deals had risen to an amount of 249,000,000 superficial feet, and of Boards, Scantling and Plank to an amount of 25,000,000 feet.

In the fiscal year 1870-1 the export of Pine Timber from New Brunswick had fallen to 4,219 tons, while 14,231 tons of Birch Timber were exported. The export of Deals amounted to 74,723 standards valued at \$1,882,553. The export of Planks and Boards was 61,397,000 feet valued at \$571,132. The total value of the Forest products of New Brunswick exported that year was \$3,048,828.

In the fiscal year ending 30th June, 1881, the Forest products of New Brunswick exported were valued at \$4,068,241 and in addition \$671,255 worth were exported not the produce of Canada. In that year the export of Pine Timber was only 2,919 tons. The export of Birch Timber was 11,764 tons. The export of Deals was 132,430 standards, valued at \$3,343,780. The export of Boards and Plank was 25,183,000 feet.

In the fiscal year 1891 the Forest exports of New Brunswick were valued at \$3,982,734 besides \$1,314,327 worth of lumber not the produce of Canada. This included of the produce of New Brunswick 2,574 tons of Pine Timber, 4,996 tons of Birch Timber, 111,865 standards of Deals valued at \$2,866,670 and 31,432,000 feet of Boards.

During the fiscal year 1899-1900 the forest exports of New Brunswick were valued at \$6,796,333, only 20 tons of Pine Timber were exported during that year while the export of Birch Timber amounted to 7,195 tons. The export of Spruce deals was 159,785 standards valued at \$1,717,564. The export of Boards was 79,822,000 feet valued at \$718,971. This total export of \$6,796,333 worth of forest products evidently included a million and a quarter dollars worth of wood goods not produced in New Brunswick, the Customs department having made a change in the classification of their goods exported and wanting as the produce of Canadian lumber sawed in St. John from logs cut in the State of Maine and floated down the St. John River. Since then there is no way of distinguishing the exports of the different Provinces because the tables of trade and navigation published by the Dominion Government only give the value of the exports of each Province without classifying the kind of goods exported. The following figures furnished by Snowball and Company give the exports for the past year:

TOTAL SHIPMENT FROM THE PROVINCE OF NEW BRUNSWICK
SEAS (X, 1900)

Ports	Sup. Ft. Deals, Ends, Scat- ling, Boards
Miramichi	110,539,984
St. John	191,579,485
Campbellton	39,889,527
Dalhousie	19,000,000
Bathurst	20,342,969
Richibucto including Buctouche	3,876,418
Outports of Sackville	8,618,794
Shediac	1,259,100
Hopewell Cape	23,173,149
Harvey	2,561,023
Total	421,980,449 Sup. Feet

These figures which I have quoted show how the lumber business of this Province has changed during the past 80 years. The White Pine, which was so abundant in New Brunswick formerly, has now practically disappeared, while the Spruce, which was so little regarded in the early days of the Province, has now become our leading export, and promises to continue so for many years to come. Indeed with proper care there seems to be no good reason why our Spruce forests should not continue to be a source of

wealth to the Province and of revenue to the Government for many centuries, if not for all time. New Brunswick at the present time is the owner of about 10,000 square miles of timber lands and derives from them a large revenue.

Last year the revenue obtained from this source amounted to about \$250,000 in addition to the revenue obtained from Game Licenses, Fishing Licenses and other sources. Not less than 108,635,000 superficial feet of Spruce and Pine and 14,982,000 superficial feet of Fir were cut on Crown Lands in the Province of New Brunswick. There were also large quantities of hemlock, cedar, pulp wood, railway ties and other lumber, the stumpage from all of which collected by the Government amounted to \$172,529. The lesson to be derived from a study of the past history of this Province and its lumbering interests is that unless our forests are preserved, the greatest resource we possess will be destroyed. The destruction of our Pine forests by wasteful methods of lumbering and by fires should warn us against allowing our forests to be dealt with in a similar fashion. There are many millions of acres of land in this Province which are more valuable for the purpose of producing wood than they would be for any other use to which they could be applied. We have plenty of land both for the farmer and the lumberman, but in locating settlers we ought to be careful not to place them on land which could be more profitably used as a forest. The neglect of this precaution in former years has been the means of placing many settlers on land from which they could not make a living and the result has been that these poor thin soils which have become exhausted by cropping are again growing up as forests. It is a fortunate circumstance that the Spruce tree is a wood in New Brunswick and that any pasture which is neglected for a few years will speedily grow up with trees and return to a wilderness condition.

By the census of 1901 the total value of our forest products is placed at \$2,998,668, whereas in that year we exported \$6,706,339 worth of forest products of which not more than \$1,500,000 worth was of foreign growth.

The census gives the value of the forest products of Nova Scotia at \$3,409,528.

Now, in view of the policy of the Government, as I have said, we had an Act passed last winter, authorizing the holding of this Convention, and in sending out invitations to the different gentlemen, especially those outside of the Province. Because we did not send in invitations to every person inter-

ested in the business in the Province, as by law they were all invited to attend. I felt it advisable to enclose with those invitations a copy of the Public Domain Act, and to request that each gentleman receiving the invitation should make any criticism upon the Act, or any suggestion he might think proper. I may say that we have not received many criticisms upon the Act, in fact, none, most people commending it very favorably, as one containing good provisions which if carried out will be beneficial to the Province.

I do not think that I need detain you any longer. I am certainly pleased to find so many present today, and on behalf of the Province, I extend a cordial welcome to the visitors who are to take part in this Convention.

The Premier then took the chair and introduced J. D. Hazen, Esq., M. P. P., who addressed the Convention.

MR. J. D. HAZEN, M. P. P.

Leader of the Opposition

May it please Your Honour, and Mr. Premier, might I also be permitted to say "Your Ex-Honour" (Ex-Governor McClellan), ladies and gentlemen, I have very great pleasure in joining in the cordial and hearty words of greeting with which the Premier of New Brunswick has welcomed here today the representatives of the great lumber interests of this Province, and in doing so, I may say that I feel that this is a welcome which is extended equally by every Member of the Legislature, as well as by the Premier and myself. I regard the Convention which is meeting today, the gathering here today as one of the most important gatherings that has ever come together in the Province of New Brunswick, and I hope, and I think we have reason to believe, that the deliberations of this Convention will be fraught with great benefit to the Province of New Brunswick, in the future, as well perhaps, as at the present.

Conventions, Mr. Premier and Your Honour, seem to be the order of the day at this stage of the world's history. There is scarcely a year that passes that important industries or important interests in the country, or those interested in them, do not meet together, for the purpose of taking counsel with each other concerning the best means that may be adopted of promoting the interests they enjoy in common. And, while in previous

years, the farmers, the dairymen, the fruit-growers and other great interests have seen the great importance there is in the interchange of ideas, and in meeting together to resolve doubts, not only from those practically engaged in the business, but from those who have read or study from theoretical and scientific standpoints, up to the present time in this Province it has not been the case. In regard to the greatest industry of all, the lumbering industry, in Canada, however, for a number of years past, we have had a Dominion Forestry Association, an association which has not annually in some of the Upper Provinces, and associated with which have been gentlemen from all the Provinces of Canada, and the publication of the proceedings of that association, circulated throughout the country, has led in a general way to stirring up the people of Canada to do all they can to preserve the forests of the country, and has done much towards advancing the lumber industry of Canada, and in our Provinces as well has had a beneficial effect. It is perhaps natural that the lumbermen in this Province, and those far removed in this great Dominion, have not taken steps to bring themselves into an association. In the earlier history of this Province, the forests were a source of danger; the settlers regarded the forests as their enemies. They saw nothing profitable in the forest, the warrening, pines and the hemlocks, because they had to get a living from the country, and to get that, they had ruthlessly, with the axe and the fire, to destroy the forests with which the country was covered. And they did not realize that the time would ever come when they would feel the need of taking steps to preserve the Forests which at that time they were doing their utmost to cause to disappear from the face of the country. However, time went by, and, as pointed out by the Premier, the Pine Forests which were the pride of this country, have practically disappeared, and in going through the Province, we find here and there some lofty old rampike lifting its stately head towards the skies, standing a silent witness to the former grandeur of the Forest, and of the fires that have spread over the country from time to time, and which have caused more destruction to our lumber industry than has ever been done by the axe of the woodsman. Today we have our Spruce Forests as a source of wealth, and so valuable has that source become, and so great is the demand for lumber, that even those trees of the forest which only a few years ago were regarded as of comparatively little value, such as the Fir, are today becoming a source of profit to the country.

The early settlers did not think the necessity existed of preserving the Forest, but as we go on from time to time, we find that today, in the minds of thoughtful men everywhere, there is no problem regarded as of greater

importance in the industrial life and industrial progress of this country than the problem of how our Forests are to be preserved, and what means are to be taken, in order to preserve them for generations to come, to be a source of profit, not only to the country itself, but to those living within the country. The man who holds Forest lands has naturally a desire to make profit, and immediate profit, out of the licenses he holds. On the other hand, the Province has at stake the problem of guarding the Forest lands, so that they may be a profit to those coming after, and at the same time to so manage them as to make them give a fair return to those who have the courage and industry and enterprise to invest their money in developing the country, by taking licenses and cutting lumber on these lands. That, it seems to me, is the great problem, in connection with Forestry today. How to care for our forests, so as to give proper return to the men who are engaged in the industry, and at the same time, to preserve those Forests, so that they will be a benefit to future generations and a source of revenue to the Province in years to come, and practically forever. There can be no doubt that the distribution of literature sent out by the Canadian Forestry Association has called attention to many subjects in this regard. One, and it seems to me, one of the greatest importance, with which the State has to deal, is that of passing proper laws for the protection of the country against Forest fires, and seeing that these laws are properly enforced. Because a Legislature may pass laws until Doomsday, but if they are not enforced, the laws are of no avail, no matter how perfect they may appear on the statute book of the country. We find that in other provinces action has been taken in this regard. In some provinces there are Forest rangers, paid partially by the State, partially by those who hold licenses from the State, whose duty it is to patrol the Forests of the Province, having signal stations on the mountains commanding an extensive area of Forest lands, and having telephone communication, so that the moment a fire breaks out they can signal for help, and in a short space of time have a large number of men on the scene, with shovels and axes and other instruments to save the forests from destruction, thus saving thousands, yes, millions of dollars to the people of the country. In reading an address delivered at the Forestry Convention last year, I was struck by a statement made, that in the Province of Quebec, a settler making a clearing for a crop of five bushels of potatoes had started a fire that destroyed over three hundred million feet of Pine Timber, that at the present time would be worth \$2,500,000 to the country. This shows in a striking manner the great necessity that exists for guarding the public domain against fire, and the

State has no more right to allow its domain to go without proper protection in this respect than an individual has to allow his house to go without insurance against fire. In this Province we have laws on the statute book for the prevention of Forest fires, and fairly good laws, but we must make up our minds that we have got to spend a good deal of money to make these laws effective. A good example has been set by the lumbermen of Westmorland, who, of their own motion, had a Bill passed in this House for the prevention of Forest fires in the County of Westmorland and assumed the burden of carrying out this Act themselves.

In reading reports of the Canadian Forestry Association I was struck with the statement dealing with the protection of the Forests, and how it was possible, with the proper cutting of the timber, to keep the forests so that they would always be a source of wealth, made by a gentleman in Ottawa last year, that in Saxony, where the State owned and managed some 430,000 acres of lumber lands, in fifty years' time over 200 million dollars worth had come out of that 430,000 acres. Lumber to the value of over four million dollars a year, and yet today there was a much larger quantity, some twenty per cent. more, of lumber standing on that land than there had been fifty years ago. If on 400,000 acres of land in Saxony 200 millions of dollars of wealth can be obtained in fifty years, it is a simple sum in arithmetic to work out what the potentialities of our wealth are from the 6,400,000 acres of Crown Land under licence in our Province, not to speak of the land not under licence, a portion of which is fit for the growing of trees, and could be made a source of wealth for this country. A mere statement of that shows what enormous wealth we have in our Crown Lands, in the 6,400,000 acres under licence at the present time in this Province. And while in this country we have not arrived perhaps at that stage when it is necessary to take the extreme steps that are taken in Germany and Saxony and in the Scandinavian Peninsula, where every man who cuts down a tree is forced to plant two or three more in its place, yet there is no doubt great good must come of our understanding the conditions that exist in other countries, and of our discussing the questions with regard to the preservation of the Forests, affecting, as they do, that great interest which every man in this country must regard as essential to the future growth and the prosperity of the country, the lumber interest of the Province of New Brunswick, which has been so potent a factor in its growth and progress in the past.

Once more, Mr. Chairman, I join with you in extending a cordial greeting to the gentlemen who have come here to attend this Convention.

The Hon. A. R. McClelan, of Riverside, Albert Co., then read the following paper:

HON. A. R. MCCLELAN

The growth and preservation of trees has become a subject of many phases and of transcendent interest to exporter of wood as well as to countries consuming it, as well as the people generally. Except in Germany, however, and one or two other of the older nations, the study of Forestry in its scientific relations is of comparatively recent date. The literature of Great Britain, except in relation to India, contains little on the subject. France has furnished a few works. Italy scarcely any. The United States have published one way and another a vast amount of valuable information, and President Roosevelt has given the weight of his great influence to its promotion. Canadians, more too soon, are becoming aroused, and the Federal as well as Provincial Governments seem alive to its importance. It has been largely with governments as with the individuals who make them. The real value of many of the country's resources are tardily recognized. It is a case of foresight coming afterwards. If Forestry in its strictest form had been considered fifty years ago, how much better off would we all be now. Even if the right of eminent domain had then been applied, and private ownership controlled by law, millions would have been saved to this Province, and everybody benefitted. At this time there is less need of interference with private rights, for the high price of the product protects the trees from needless destruction while the reports of these discussions must tend to the same end.

New Brunswick still retains for controllable public advantage between six and seven million acres of the "Forest Primeval," a larger proportion of the whole area than is usually found in well settled districts. The Commonwealth of Australia is said to have 110 million acres of woodland, and only 18 millions or about one-sixth reserved for Forestry purposes, while New Brunswick retains over one-third of the whole Provincial area. Professor Fernow, of Cornell University, published in 1902 a very exhaustive and valuable work on the "Economics of Forestry," from which I have made extracts. He points out the growing demand for wood goods while civilization advances and industrial activity increases, as shown by statistics of the exports of woods to European countries. Great Britain is almost wholly supplied by importation and the quantity used there has steadily increased year by year. France is a still more striking instance of an increasing

demand for wood goods—and even Germany, so famous for its conservative forest management and thrift (to use the words of Fernow, an exporter till 1863, now pays over \$70,000,000 for wood in excess of exports). These three leading nations, with all the last half century has developed, in new discoveries and scientific progress, and notwithstanding the substitution of iron, stone, brick, etc., for structural purposes and coal for fuel, are making yearly demands for more wood in one form or another. Pulp for paper is everywhere making enormous inroads on the forests, and especially the Spruce, the wood chiefly employed in the manufacture of paper.

Our neighbors of the United States, with large forest resources and a remarkably progressive development, fail, even with a protective policy, to keep our wood products out of their market.

There seems little need to show more conclusively the continuance of a demand for export, or the value of the trees as a permanent asset. How best to promote the growth and preservation of the trees is the question we have met to consider, and the action of the Government in asking for an exchange of ideas from those having different points of view, is well directed and cannot fail to be of considerable advantage. Looking to the future, which is considered a statesman's duty, re-forestation becomes a matter of paramount consideration.

Norway and Sweden, our chief competitors in the English market, for a century had strict laws protecting the forest. Not only comparatively, at a recent period have given attention to planting. From a report of a commission sent out by a University in 1892 Sweden will by protection and reforestation continue, if not increase, the present yearly cut. Of the Spruce, Pine and Fir, the chief productions, the Spruce is said to be gaining over the Pine. It may be of some interest to note that Japan has had a forest policy earlier than any European nation, and has now excellent arrangements for a protective procedure. From the earliest period edicts were issued to provide for and ensure the planting of water sheds, to reduce dangerous floods. A Forest Academy, after German models and supervised by German foresters, was established in 1882, which in 1890 became incorporated with the University of Tokyo. The State forests comprise 17,700,000 acres, or about 20 per cent of the total forest area.

To the student of Forestry, however, no nation of as greater interest than any, since a long and long period, the Government has struggled to maintain, by planting and re-foresting, a large area of productive forest.

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land. Large tracts, unfitted for successful cultivation, which have been stripped of trees by private owners, have been re-purchased by the State and re-stocked at great expense. Thus, as Fernow says, "public money pays for public folly."

We noticed by the discussion on the recent opening of the Legislature, that reforestation will have the attention of the Government and the best method of proceeding thereon, becomes a question of much interest.

A gentleman of Ontario informed me that he had grown from seed a considerable quantity of black walnut trees, valuable for wood and nut bearing, but on inquiry, Mr. Robertson, of the Experimental Farm at Nappan, Nova Scotia, says that on a fair trial he found much difficulty in growing these trees successfully in the climate of these Maritime Provinces. Perhaps others may be able to report more favorably.

In rapidity of growth the German record shows that Spruce, for the first ten years, has less percentage of increase than Fir or Pine, but after that period, the accretion is yearly greater than shown by these other kinds. The increase of wood yearly per acre, is of course largely dependent on soil and other conditions, but it would not perhaps be an exaggeration to expect in some locations an annual addition of from 600 to 100 superficial feet.

Where lands have been denuded of trees and are unfit for profitable cultivation, the question of the best means of securing a return of growth is important. The natural rotation of nature's demands, the adaptation of varieties to the soil, the differing rapidity of growth, and the ultimate value of various trees, all bear on this interesting subject of reforestation and I feel convinced that the opinions of gentlemen who are conversant with such matters, will not be the least interesting records of the session.

The ravages of fire and the axe have in the past contributed vastly to the diminishing of our property value in forest lands, but with increasing realization of these drawbacks, and the employment of better facilities for their reduction in the future, encourage the hope of great improvement in many ways. We will come to recognize and value the forests for the regulation of water flow in streams, providing a more uniform supply of well water, as wind brakes and a health restorer, as a covert for harmless fur bearing animals, a shelter for the birds, a cool resort for tourist and huntsman and for the student of nature who likes to roam for pleasure "in the pathless woods."

Let us take an illustration bearing on this general question. Suppose the Hon. Surveyor General, who could perhaps with more propriety be named the Minister of Crown Lands and Forestry, owned for himself in fee simple all of this 6,400,000 acres of land with ample means to care for it, what would he as an intelligent and provident gentleman do with it? He would not impair it for the purpose of getting great immediate profits, which might be wasted, but so protect it, that it would remain for his children and their descendants for all time a valuable and increasing source of revenue. It demands a higher style of honor, to deal with a trust which in the case of public lands, not only conserves the best interests of the charge in hand, but also indirectly promotes in many ways the wealth and the happiness of the community in general.

It was only natural that our forefathers, the pioneers of the soil, when the clearing off of the trees was a necessity, should impart to their children similar habits of destruction; but the boys and girls of this epoch should leave school with feelings more in consonance with the country's requirements.

In the higher educational institutions increasing attention is afforded to nature studies, which will surely help in the cultivation of a greater interest, by the young of both sexes, in forestry. The educational department is, I am convinced, always desirous of promoting in all the schools a knowledge of tree culture. Shade trees about the homestead and along the roadsides, apart from their intrinsic value, add much to the aesthetic appearance of rural districts, and are appreciated by tourists and other visitors.

In the order of creation, the characteristic of the grandest of all laws is variety, and this Province in its topography, exemplifies this feature. The mountains and streams, the forests and glades, all add to the wealth and welfare of the people. Much is written about Canada's western heritage, where people accustomed to a flat and treeless prairie successfully grow cereals for food, but here we have a heritage more enduring, affording to the youth of their native land such an interesting diversity as is conducive to high mental development and noble achievement. Other sections may have greater special attraction but for the attainment of the largest average of this life's happiness, there is probably no place superior to New Brunswick.

Hon. Mr. McChesin was followed by Elisha Stewart, Esq., President of the Canadian Forestry Association.

ELIHU STEWART, ESQ.

THE GENERAL NEED OF FOREST PRESERVATION

When I began to consider that I had undertaken to say something on so comprehensive a subject as that suggested by the title of my paper, "The General Need of Forest Preservation," one on which a whole book could be written without exhausting the subject, I felt myself much in the same position as the old German professor who after devoting his whole life to the study of Greek nouns on his deathbed expressed regret that he had not confined himself to the dative case.

I shall therefore only attempt on this occasion to deal with the question as it affects our own country.

Canada has been blessed with many free gifts from the bounteous hand of nature. We have the fish in the sea and in our inland lakes and rivers. We have the wild animals of the chase, the fur-bearing animals and wild fowl in every part of the country. Minerals in untold and unknown abundance. We have a vast area of fertile soil, the potentialities of which can scarcely be imagined; and last, but not least, we have the subject of my text, the forests.

Of all these gifts the forest is the freest. In the products of the soil it is necessary to prepare the land and sow the seed before reaping the harvest. In those of the mine it is generally necessary to expend considerable labor in development work in search of what may or may not prove profitable in the end. At best the miner is seeking for hidden treasure. The fisherman casts his net into the sea with no certainty whether the return will be large or small.

How different with the lumberman! The wealth of the forest lies open before him. The crop is his without the sowing. He simply reaps where nature has prepared the soil and cast the seed, and the centuries without his aid or even care have nourished the plant and brought forth to his hand the fully developed product. With him it is simply a matter of appropriation in which he usually has the Government as a partner.

It is worthy of notice too that as only about one per cent. of the food contributing to tree growth is derived from the soil, trees do not deteriorate the land on which they grow and no rotation of crops is necessary. The same varieties can be grown on the same soil for ages.

Forest preservation and forest perpetuation are necessary for two main reasons; first, on account of the effect of forests on climate and water; and second, on account of the product that the forest yields in the wood it produces. Let us first consider their effect on climate and water.

Geology informs us that in a remote age in the history of this continent the whole of north-eastern America was denuded by glacial action of all vegetable growth; but when a milder climate succeeded, the forest, obeying that principle of life which is so characteristic of it in both the animal and vegetable kingdom, namely, its essential qualities of surviving wherever its environments will permit and of propagating its kind, soon began to encroach on the treeless land and at the time of the discovery of America there was an almost unbroken forest from the Atlantic seaboard for over a thousand miles inland. This the pioneer settler was compelled to destroy in order that the land might be used for agricultural purposes. This action on his part was necessary, but it has unfortunately been in many cases carried to such an extreme as even to prejudicially effect the well being of the husbandman himself in interfering with the flow of streams and disturbing meteorological conditions that are essential to his existence.

Let us notice for a moment this phase of the subject. We see the great rivers pouring their waters into the ocean. They are fed by thousands of tributary streams which receive their supply far inland at high elevations. These feeders are only channels that serve a purpose in the great plan of distribution.

The heat of the sun is the first great agency in this plan of distribution. By this agency vast quantities of water both from the sea and land are converted into vapor which rises in the air and is carried in all directions. When this vapor reaches a lower temperature it condenses and falls to the surface of the earth. All that falling on the land which is not again evaporated is ultimately carried by gravity to the lowest level, namely, the sea.

The greatest amount of evaporation, other conditions being equal, will be where there are the greatest areas of water, and precipitation will also be greatest there, for those regions remote from the sea where the greatest evaporation occurs will only receive that portion that has escaped condensation in the journey through which the vapour has been carried. A good illustration of this is afforded by the large rainfall of the east and west coast of this continent and in a lesser degree in the neighborhood of other

great lakes and the very light annual precipitation in the plains of the interior of the continent where summer droughts are constantly feared and where irrigation is frequently necessary to plant growth.

The precipitation is greater on mountains than on the low lying land in the vicinity. This land elevated high above the surrounding country intercepts the air currents fully saturated with vapor which at these cooler heights is about at the point of condensation and the result is that a very large amount of moisture is deposited there where gravity again resumes its functions to convey the water back again to its home in the sea.

In these operations so far, that is, in the evaporation, conveyance of vapor and precipitation in liquid form, it is evident that man has, and can have, no part whatever, but once the water starts on its downward course from these elevations, then his actions may affect the rapidity of its course, and it must be confessed that all too frequently his interference here has been prejudicial rather than beneficial.

Purpose and design are characteristic of every operation of nature even though we sometimes fail to comprehend them.

Consider, for a moment, the object in view in all these elaborate operations. Evidently one purpose at least was to supply the great valleys lying between the mountains and the sea with an even and perpetual supply of water without which both animal and vegetable life could not exist. But it is evident that the elaborate operations we have noticed, the evaporation of water into vapor, the transport of the latter to the inland regions, with the condensation and precipitation at those high elevations, would fail to fulfil the evident design if there were no barriers to prevent the rapid and tumultuous escape of the water from those heights, and in order to accomplish this and thus prevent disastrous torrents at one time and drought at another we have a network in the forests that in a natural state when not destroyed always grow on the mountain sides, forming a natural reservoir, of which the artificial reservoirs for the water supply in our towns and cities are in a sense but poor imitations.

From what has been said it will be noticed that we have several distinct divisions, so to speak, in this work. First, evaporation; second, the transport of vapour; third, condensation; fourth, precipitation; and lastly, dissipation. By the last term we mean the disposal of the water after condensation, and there are two ways that this may take place, namely,

either by evaporation into the air, or by the agency of gravitation which will ultimately carry it back again to the sea; and the forest assists in retarding dissipation in both cases. The shade and consequent lower temperature and absence of strong air currents retard evaporation which is therefore many times less in the forest than in the open field. Again, the absorbing qualities of the forest floor are very much greater than in the open. The soil is loose and is covered with leaves, moss and decaying timber. The roots of the trees serve as pipes to carry the water down deep into the soil. In this way a great natural reservoir is formed whose outlets are the thousands of perennial springs and brooklets that evenly and continuously go to feed the larger streams and these again the great rivers of the country. Now, consider the effect produced if this timber is removed. There is perhaps not much difference in the amount of water precipitated but instead of being absorbed as before, the greater part of it being unobstructed in its course rushes down the mountain side in torrents; disastrous floods follow, often carrying away bridges and inundating fertile low-lying valleys and carrying away alluvial soil down to the mouths of the streams where it is deposited in great bars, thus impeding navigation and annually entailing large sums of money in removing it.

This is the result of interference with nature. We have seen the elaborate means she employed in depositing this water at those elevations. She has woven, as we have seen, a network for the conservation and even run-off of this supply, and all she asks is that we do not prejudicially interfere with her operations. She does not even go so far as to say, "Woodman, spare the trees," for all the valuable timber could be removed when it attained a proper age without in the least injuring the forest floors for this purpose. Again, she does not ask you to reserve the fertile valleys but only the rough mountain side where the elevation is frequently too great for the growth of cereals and where the land is better adapted for the production of timber than for any other purpose.

The people of North America have been exceedingly profligate in this regard and the penalty is being paid every spring, first in the disastrous floods experienced in so many localities, and later on in the season by the drying up of the once never failing springs and perennial streams, and it is time a note of warning was sounded that would arouse our people to a sense of the danger that threatens us in this regard. If anyone should question our reasoning on this point, let him but look at what has actually occurred in older countries where irrational forestry methods were pursued in the

past. Take a large portion of Europe bordering on the Mediterranean in Spain, Italy and Greece, as well as large tracts in Northern Africa and in Asia Minor, where in the middle ages were to be found fruitful valleys and the homes of a prosperous rural population, but which today is almost a desert, where the inhabitants are reduced to beggary by the drying up of the country consequent on the denudation of the forest on the mountain sides.

But we need not go so far afield, for we have examples in these older provinces of the Dominion where inundations occur almost every spring from streams which in former years, before the country was denuded of its timber, no inconvenience in this respect was ever experienced.

There is not a province of this Dominion that is not interested in this question. Starting furthest west: What would be the condition of British Columbia if the mountain sides were denuded of the timber that is now growing there. What of Alberta and Saskatchewan, if that great reservoir along the eastern base of the Rocky Mountains were destroyed, as it would be if the timber were destroyed along the eastern foot hills of that great mountain range.

The husbandman of those plains fears the summer drought far more than he does the summer frost. The precipitation is very light; in some places insufficient for plant growth and large irrigation works are in progress of erection, which will be useless unless the reservoir is kept intact. Destroy the forest covering along the upper Bow and those irrigation canals and ditches will be raging torrents for a few weeks and without water when it is required. A large section of Manitoba is also dependent on the forest reserve in the Riding Mountains for an adequate water supply. Ontario and Quebec and your own province all require to conserve their water supply, not perhaps so much for agriculture, for they have a greater rainfall, but in order to preserve an even flow in their rivers and streams, thereby retaining their value for water power and other purposes.

Many of you will be able to recall to memory the forestry conditions in these older provinces as they existed in your youth. Fields surrounding the farm house and the outbuildings, with the woods hard by in the rear. You will recall the paths through those woods and the perennial streams flowing through them. You can almost hear across the interval of years the thrill of insect life and the bird songs of the forest. How changed today! The country is now cleared up and is, in too many cases, as bare of trees as our

north western plains. The old creeks and brooklets have disappeared and water famines are not infrequent.

How different would be the appearance of our rural sections today if our fathers had left here and there a few acres of their choicest woodland, and also along the roadsides an avenue of forest trees, but they cut them all down and are now planting small ones which it will take a century to equal those destroyed.

How applicable to our case are the lines of the gifted poet of the Sierras when he says :

"God gave us mother earth full blest
With robes of green in healthful fold.
We tore the green robes from her breast,
We sold our mother's robes for gold.
We sold her garments fair, and she
Lies shamed and bleeding at our feet
In penitence we plant a tree,
We plant a tree and count it merit."

Captain Eads, the eminent American engineer, made a remark a few years ago when he was engaged in building dykes along the lower Mississippi and a jetty at its mouth, which has a world of meaning in it. He said he was working at the wrong end of the stream; and it was perhaps more than sentiment that led the Boston philosopher, Thoreau, to exclaim as he witnessed the destruction of the forest on his New England hills, "Thank God, they cannot cut down the clouds."

But it is useless to recall lost opportunities, except as an incentive to future action to reclaim as far as possible what has been lost, and the question is, to use a street expression, "What are we going to do about it?"

I am glad to observe that New Brunswick has recently taken very decided action, as is shown in the Act of last Session, dealing with this problem, and so far as I am able to judge, the Act is one that if carried out will be attended with excellent results and will be commended by future generations if not by those now living. There is just one provision that I would suggest which perhaps might be added, and it is this, that in any future patents of timbered land a proviso should be inserted that at least 10% of the area conveyed should be left in forest; that the timber growing

thereon should be the property of the owner of the land but to be cut only under the direction and supervision of the Government and in such a way as not to impair the land as a forest reservation.

Let us now briefly notice the second phase of this subject, namely, the need of forest perpetuation on account of the wood product.

It is only within recent years that uneasiness has begun to be felt for the future supply of timber, and in America the public at large do not yet realize the situation.

It was thought by some a few years ago that the increased use of iron, brick, stone and cement in structural works and the more general use of coal for fuel would lessen the consumption of wood. This has, however, not been the case. On the contrary, statistics show that not only the aggregate consumption in civilized countries has greatly increased, but what is more to the point, the per capita consumption is greater today than it has ever been before.

This increase of wood consumption parallel with that of the other materials I have mentioned, as Dr. Fernow says, simply accentuates the influence of the great modern development and increase of civilization, which means increase in the wants of the population.

The manufacture of pulp and cellulose alone is now consuming immense quantities of our spruce and other woods. Taking the whole consumption of wood the world over for the various uses to which it is applied, and then taking into account the visible means of supply, and the outlook is by no means reassuring. One thing is certain and that is that a time of great scarcity is within the near future if the timber producing countries do not at once commence to husband the forest wealth which they possess but of which so many of them seem to be oblivious.

What must be the result of an ever increasing demand where the supply the world over is diminishing?

Our total exports of wood and manufactures thereof of home produce amounted in 1903 to \$49,742,641, being an increase of over five and a half millions over that of the previous year, and of this the United States took \$18,823,878, which was also an increase over what she took from us the year before of over \$2,000,000.

Even Germany, which has taken the lead in conserving and managing her forests, has been importing timber since 1863 and now pays annually over \$70,000,000 to foreign countries for that article.

M. Melard, Inspector of Forests in the service of the French Republic, in his recent work on "The Insufficiency of the World's Supply of Timber," says:

"There are but seven countries at present able to supply large quantities of timber. Five are in Europe, namely, Austria-Hungary, Sweden, Norway, Finland and Russia; two are in North America, namely, Canada and the United States. It has been shown that the availing surplus of Austria-Hungary, of Russia and of the United States is seriously threatened by increase of population and by industrial development and that of Norway by the abuse of the axe. There remain only three sources of supply in which confidence can be placed for yet a little time. These are Sweden, Finland and Canada. They are absolutely and hopelessly insufficient. If Sweden, Finland and Canada were to attempt to supply all the countries which reach out their hands for timber, their normal production, and their forests too, would be disposed of completely in a very short time, revenue and capital alike. A timber famine is thus within sight."

But it may be said that this is the view of an altruist who has not studied the past history of the world. It may be truthfully pointed out that nature has always come to man's relief in his extremities; that when wood fuel became scarcer in the older countries of the world, coal was found to replace it, and that in recent years natural gas and petroleum have in many localities even replaced the coal. While this is true we must remember that these are both inert materials without the power of reproduction or the ability to increase the quantity; that every pound of coal and every foot of natural gas used decreases the aggregate quantity by that amount; and without going into details it may be said that the increasing use of these materials is becoming so great as to indicate a famine here also in the not distant future. But the close observer will reply that even if these sources of fuel supply were entirely exhausted we have at least in this country another natural agent to fall back upon in electricity, which can be generated in enormous quantities by the power now mutilated in the thousands upon thousands of water power to be found in almost every part of the Dominion. This is undoubtedly true and leads me to an almost virgin field. I am of the opinion that this country has advantages in this respect which few countries

can equal, but what would be the value of these water powers unless the reservoir from which the water is derived is preserved by the forest in the neighborhood of the source of supply, thus ensuring an even and continuous flow.

We have already noticed how our export of timber to foreign countries is increasing from year to year, not only to the old world but even in a greater ratio to the United States. We have quoted the opinions from the best authorities in the world, that their only hope for the future is in Canada's supply, but there is one quarter from which an ever increasing demand will come that we have not so far noticed, and that is from our own people.

We find the total value of forest products as given in the census returns for 1901 to be \$50,183,044, while the exports for the same year were only \$32,852,190, leaving \$17,330,854 as the value of our home consumption. What the increased future home consumption will be will depend on the increase of our population, and when we witness the rapid increase of immigration during the past few years into a country such as our North West prairies where every stick of timber used has to be brought in, and when we see the vast extent of that country to be supplied, it is evident that our home market for lumber will continue to enormously increase. Taking this along with the foreign demands we cannot but conclude that we will require an immense supply to meet all these requirements.

Have we such a supply?

This is a question very difficult to answer but this much may be said that unless the people and the several governments of the country awaken very soon to the importance of the question and adopt a more rational policy in dealing with their forests than what has prevailed in the past they will find when the days of great scarcity arrive how unwise and imprudent they have been in failing to look a little into the future and to conserve and perpetuate their greatest natural resource.

The present is the time for action. In the case of agricultural products a scarcity of supply can be quickly replenished by increasing the acreage under cultivation. How different with the forest. Most of our timber trees are from fifty to one hundred years old, some of them much older, but growing side by side with these are others in all stages of growth from the young seedling just starting on its course up to others which have waged a

battle for existence for over two score years and which by that conflict have nearly fitted themselves for the use of the lumberman. This is the woodsman's growing crop and should be looked after by him with the same care that the agriculturist bestows on his immature field crops.

There are several reasons why forestry claims very careful attention from the State. First, on account of the communal interest in the forestry of a country being so large as compared with the individual interest. The popular idea of the value of the forests, as only for the actual commercial value of the wood to the individual who owns the land, is as far from the truth as it would be to assert that the only value of water in the great economy of nature is restricted to the use made of it for drinking purposes, entirely ignoring the fertilizing effect of rain, the power derived from the waterfall, or the great benefits it affords as a means of transportation.

It is recognized as a principle in law that no individual has a right to divert water from its natural course, and when we consider that by destroying the forest, natural conditions are interfered with at the very source of supply many times more injurious to the community than changing the course of a stream, it is evident that an enlightened forest policy, by which the conditions at these sources of supply are not prejudicially interfered with, is a legitimate matter for the state, as representing the community, to deal with, but, as before stated, in our case at the present day, with the land at most of the great water-sheds still in the hands of the Government, it requires only a proper land and forest policy rightly administered to ensure for this country what older and more thickly settled countries can attain only by purchase of the land from the individual owners.

Another reason why forestry belongs especially to the state is owing to the length of time required for trees to attain maturity. In order that an ordinary forest may attain its greatest commercial value, as before stated, a long period of from 50 to 100 years is required, so that there is little incentive to the average individual looking only to his own immediate interest to engage in an enterprise such as tree planting, as a commercial venture, when he knows that his career in this world will have closed long before the return for his labor can be realized. With the nation the case is very different. It is impossible for the individual to realize his return owing to the brevity of human life, but this standard of measurement does not apply to the nation whose existence is calculated not by years but by centuries.

Every acre of land should be utilized for the production of that variety

of crop for which it is best suited. The system that has been too prevalent in the past of allowing settlers, many of whom were ignorant of the capabilities of the land on which they settled, to locate wherever their fancy directed them, should be stopped.

The once accepted idea that governments existed only for the protection of life and property is too narrow for the present day. As society becomes complex it is more and more observable that "no man liveth to himself," his life is but a part of the life of the community and his very existence is interdependent. More and more are communal interests encroaching on those of the individual. This necessitates trusteeship and in many cases the proper trustee is the Government. Especially is this the case with natural resources still in the possession of the Crown. The Government as representing the nation certainly is vested with the authority as well as charged with the responsibility of their management, and in such management it is not sufficient that the welfare of the present generation should be kept in view but succeeding ones as well.

Let me in conclusion, even at the risk of repetition emphasize the fact that the natural forests of the country belong not specially to one generation, they are a heritage given us for frugal use and not for profligate waste. How many of us labor to leave our families comfortable but fail to remember that every Canadian boy is the common inheritor of a vast heritage that nature has given to the Canadian people and which in many cases we have allowed to be despoiled in our hands.

Let us see to it that henceforth we do our part to hand down to our successors the portion of the forest inheritance that is their due. Fortunately we are dealing with that kingdom of nature where reproduction and growth are found. The life forces are working with us and there is no reason why future generations for all time may not continue to reap an annual harvest from our forests no less certain and no less profitable than that derived from the field.

The Premier then announced that any of the foregoing papers might be discussed. No one present offering any remarks, the Convention adjourned until 2.30 o'clock in the afternoon.

AFTERNOON SESSION, WEDNESDAY, FEBRUARY 20TH

Convention was called to order by the Premier at 2.45 o'clock, when he announced that any discussion would be in order.

The following persons then addressed the meeting :

The discussion was opened by Attorney General Pugsley.

HON. WILLIAM PUGSLEY

Attorney General

I think we must all agree that the addresses delivered by His Honour the Ex-Governor of the Province and by Mr. Stewart, the President of the Dominion Forestry Association and Chief of the Dominion Forestry Bureau, were of the most admirable character. They gave us a great deal of information and were calculated to arouse a great deal of interest in the minds of all concerned for the welfare of our country. In listening to the addresses with which we were favored, I have been impressed with the fact that the idea has been brought out, that so far as the Crown lands of the Province are concerned, it will be quite feasible to make such regulations and to take such precautions for the future management of the Crown property as will preserve the forests to the people of the Province. While not unduly interfering with the settlement of the country, it is calculated to preserve the flow of the streams through the forests owned by the Crown, and also to preserve the water powers. But no reference has been made to the land which has been granted, to the streams and rivers which are flowing through lands which have passed from the Crown into the hands of private persons. I know that in a great portion of the Province, particularly the southern portion of the Province, in my own county, the County of King's, the land has nearly all been granted, and on the head waters of the streams the forests have been cut away, and these great difficulties, to which reference has been so eloquently made, are occurring, and will continue to occur to a great extent in the future. In the beautiful valley where I was brought up, the Sussex Valley, I can remember as a boy when the country was well forested, with a beautiful stream running through that valley, having plenty of water in it all the season, flowing between comparatively narrow banks. Today, there is a broad expanse of gravel; hundreds of acres of valuable soil have been carried away by the great floods which come down in the spring of the year, and then in the dry season of summer there is scarcely any water at all in that creek. Now, what I would like to be informed upon, is as to whether or not, in the opinion of Mr. Stewart, it has had occasion to give great thought to the question. It would be consistent with a fair regard of the rights of private individuals that there should be some legislation which would prevent this devastation going on in the future. Whether

the public interest is so paramount as that the Legislature could properly regulate the extent to which the forest upon private lands at the head waters of these rivers and streams could be cut away? Or, if it were thought not possible to legislate in that direction, whether the public interest would be so paramount as that the Government would be justified in taking proceedings to acquire, to buy back again, the land situate at the head waters of these streams? This question, so far as concerns us who live in the southern part of the Province, is one of great magnitude, and one which will be of great importance in the future. As Attorney General, I would be charged with the drawing of a Bill, if any legislation should be proposed in the future, and if anybody can give me the ideas, I think the Premier will say that I can draw a Bill as well as anybody—but I want the ideas. If Mr. Stewart thinks this subject of importance, I would like to hear from him regarding it. Of course, you know, Mr. Chairman, that the Legislature can only be gulled in these matters in so far as they are sustained by public opinion. So I think it is desirable that every one of us, who have any difficulty in regard to these matters, should gather information as far as we can upon the subject in our minds.

MR. STEWART—Well, Mr. Chairman, ladies and gentlemen, this, it seems to me, is a question of degree, as to whether the Government would be warranted in going into this or not. As the honouable gentleman has said, if the public interests are paramount, if in certain of the streams it is necessary in the public interests, in the interests of the parties owning the land in the valleys, to do that, then to require this land, if it cannot be done any other way—if you cannot persuade the owners of these lands to do something themselves, to obtain the prevention of the devastation of their forests, then I suppose this is next in order. Of course, this is a question which you will be better able to pronounce upon than I can, but, on the spur of the moment, it seems to me that perhaps there might be some legislation which will hold out sufficient inducement to the owners of these lands themselves to take up this question, and to preserve these operations at the head waters of the streams in forests. There is no question at all that, if the cutting away of the forest, the source of water supply, is going to injure, to the extent it will in many cases, the whole face of the valley below, then the Legislature, I should think, would be warranted in passing legislation to this end, always respecting private rights as far as possible. The United States Government, in the Adirondacks, are purchasing back large tracts there and reserving them, in order to preserve the waters of the Mohawk and the Hudson, which are being affected by the cutting away of the forests

in these mountains. I scarcely feel like giving an opinion on a matter that I am not personally acquainted with, but as far as occurs to me on the spur of the moment, it seems it may be possible that you might pass legislation making it profitable, even to the holders of land in the upper valleys to retain the forests. In most cases, the land of the upper valleys is more valuable for timber than it is for agriculture. I am very sorry that this question was just sprung a few minutes ago, and that I have not had time to give it any special consideration. I think it is probably one that many of you here, knowing the local conditions, will be better able to discuss than I can.

I might say, Mr. Chairman, that a few years ago, I started to write a work on "The Farmer's Wood Lot," and I gathered what information I could, but I found that I was getting into deep water, because it would require a great deal of research, to find what powers the municipalities had in the matter, and then there was the question of taxation, a very important one indeed the question is, one that has not been dealt with in any Province, I know, that is, the reservation from taxation of wood land. It is most unfair the way wood land is frequently taxed. I do not know whether it is so in this Province or not, but it is so in many of the older parts, and the owner of wood land has not the inducement he would have to keep his timber, because he is taxed every year on a product that will only mature in a lifetime or more. You can easily see how unfair it is to tax the wood lot every year at its value, when it can only be reaped once in perhaps 75 or 100 years. There is a question that perhaps a little thought might be devoted to, as to the release from taxation of certain wood lots. The Province of Ontario has recently passed an Act in reference to that, the release of certain lands from taxation of wood lots. There are many questions that a consideration of this matter would give rise to and that would bear on the question that the Attorney General has suggested.

PROF. G. U. HAY- A matter came up this morning in Ex-Governor McClelan's paper about the growth of Black Walnut, and the fact that we are rather too far north here for its successful growth. I am inclined to think that in the good land of New Brunswick perhaps the Black Walnut would flourish. I have a tree growing on my place at Westfield that is ten years old now, and it has grown fully as well as other trees of native growth that were planted about the same time. Of course, the black walnut is one of the most valuable trees, and if anything could be done to promote its growth here, it would be very well. Our White Walnut, or Butternut, is almost exhausted now. I was talking with a dealer in woods a little while

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and he said that he had to import all the White Walnut, or Butternut, he used now.

I think the Government is to be congratulated, Mr. Premier, on instituting this Forestry Convention at this time. I am a little surprised that we are not more home, such a valuable opportunity as this affords of bringing something about Forestry, I think should be taken advantage of. No place in any country in the world has so better natural conditions for the growth of trees than in New Brunswick; certainly, there is no country better watered, where there is such a network of streams and rivers as we have in New Brunswick, and the intimate connection between these streams and the growth of forest growth was very well pointed out, I think, this morning by President Stewart; although perhaps he did not go far enough in pointing out the point, which I would like to emphasize, that is, that if we cut down the forests on our hillsides and the neighborhood of our sources of streams, we are cutting away one of the assets of our Province. We all know, as he pointed out, the condition of such countries as Spain, where the growth has long ago been cut down, and where there are now bare rocks upon the mountain side—there was only a little soil and that has washed away. Well, what does it do? It brings down the dirt in summer, and renders our streams and rivers not navigable; then again, when freshets come, they carry away this valuable alluvial soil, and instead of depositing its loam, with a moderate freshet, this great freshet comes and sweeps it out to sea, where perhaps it may be useful some thousand years from now, when these lands rise and become part of our coast country, but that is a time that is rather too remote to be of any use to us.

I say then, in closing, that I congratulate the Province that this Forestry Convention is in order, and is so well established as it is today, and I hope, as you expressed this morning, Sir, that we may have something permanent in this as an annual Forestry Convention.

Dr. C. C. Jones, of the University of New Brunswick, then addressed the Convention as below:

C. C. JONES, ESQ., M. A. PH. D.
Chancellor of the University of New Brunswick

THE ATTITUDE OF EDUCATIONAL INSTITUTIONS TOWARD FORESTRY

Mr. Premier, Gentlemen: The subject that has been assigned to me for discussion is "the Attitude of Educational Institutions Towards Forestry."

We may say, in a word, that the attitude of educational institutions should be one of extreme sympathy, and should present every element of helpfulness and encouragement towards such a practical science as Forestry. So far as this Province is concerned, that sympathy should not be altogether of a sentimental sort. When we consider how much of the revenue of our Province is derived from the resources of the forest, and when we consider also that our public schools are dependent upon the revenues of the Province, I think our educational institutions have indeed good reason to give every encouragement they can to such a movement as that being inaugurated in the Province through this Convention. In general, then, and so far as the public schools of the Province are concerned, in their attitude towards this question, they should, so far as possible, reflect and stimulate public interest in the subject of Forestry. I am not in favor of making our public schools in any sense professional schools. Professional work has very little place in the curriculum of the public school. Nevertheless, anything that the public schools can do to reflect public interest and stimulate public interest in this question they should always do. So far as any work along the line of practical lumbering or practical Forestry as a profession or business is concerned, I think the public schools should have very little to do; but there are some things in connection with the Forestry work which are of extreme public interest and which the public schools could very well consider to a considerable extent. Among those things is, first of all, the subject of revenue. I think that a very useful part of public school education might be a consideration of the ways in which the revenue of our Province is made up. It is as important that the students in the public schools should know how the revenue of the Province is made up and how distributed, as it is to know the population of some town in Central Africa. College men are always supposed to be very conservative; however, I am altogether, so far as I myself am concerned, in sympathy with getting down to practical work in educational lines, and one thing the public schools could touch to great advantage is this question of the revenue. And in considering it, so far as a tax on forest products is concerned, it will stimulate the interest of the children, and, in the future, the people of the Province, in its revenues and matters connected with them, all of which will be very helpful.

Secondly, I think the public should be interested largely in the Forestry question, because of its economic value. Apart from the earth itself, the forest covering of the earth is the most valuable asset that Providence has endowed this country with, and the public schools should be led to see this fact. The value of the forests of the country, so far as regards its economic

value, is of course evident to everyone. There is the product of wood, which is used, and will be for all time to come, for building, for construction of public works, such as bridges, for the construction of railways, for the construction of slips and for many other practical utilities; and when the children have pointed out to them the great value of the forest products of our country along these lines, they will be more interested in the Forestry question and interested in all movements looking towards forest preservation—the preservation of the forests of our country.

Then, there is the matter of forest protection. I think the matter was touched upon this morning—from my point of view, I think the children in our schools might be very largely taught the various items in the subject of forest protection. We all know the value of forests to regulate the flow of water in our rivers. It is a matter of common observation to us, and might be made a matter of common observation in any school, to see how, where the forests have been cut away from any hill side, the rush of water in the spring tears away the soil, and how its mad rush to the ocean causes a large amount of danger from floods. In the City of Montreal, of late years, where very destructive floods have occurred, it has been shown to be largely due to the cutting away of the forests at the head of the rivers. So, I think this should be made a subject of observation in every public school of the Province, and would be a very practical one along this line. I have in mind a stream, where I used to spend many a day when I was a boy, dangling a line, with a pin hook on the end, for trout. Later, the forest growth along the stream was largely cut away for the purposes of fire-wood, and what was left, after the cutter was through, was largely destroyed by fire, and the stream dried up every summer, so that there was a lack of water supply for the people along the stream. Recently, however, I have seen that a considerable growth of wood, a very dense growth in some parts, has grown up along the banks of that stream, and of late years the stream has not gone dry in summer, but there is plenty of water there; and I feel that that is what is happening on a large scale in respect to all the feeders of the streams of our Province, and although we may not see it so plainly with regard to the River St. John, which is such a large stream, still in time we will see its effect even on this magnificent river of ours.

Then, there is the protection against wind afforded by the forest. We all know the benefit of a sheltered locality, for building and for all purposes, even in this country of mildest climate. There is also the protection against snow and landslides from the steeper hills of the Province, which is brought

with an instructor, we could carry on almost as good a School in Forestry as could be found in any Province. Remember, the Yale School of Forestry has only been in operation a few years; the whole science of Forestry is practically in its infancy, and I feel that in this Province we have just as good a ground for the establishment of a School of Forestry as anywhere in this continent. So I thought it worth while to outline this Syllabus in connection with the courses established at the University.

Now, I feel that at any University, establishing a course in any professional line, first of all there should be laid a very broad basis of general educational value, so I have put in this course a great many subjects which may be regarded as subjects of educational rather than Forestry value. In connection with the Yale School of Forestry, they require a degree in either Arts or Science from a recognized University, then the course is completed in two years. So it is generally recognized, so far as the University Forestry courses are concerned, that there should be a general basis along educational lines. Therefore, in the first year, I have included the general subjects of English, Mathematics, Modern Languages, and in the first year Botany, and in the second Physics, then I have added in the first two years the subject of Drawing, which is at present, of course, taught in connection with our engineering work at the University. Now, we all know the value it would be to a lumberman to have considerable experience in the drawing of plans and in the formation of working plans for working over a wood lot, and it is important that any man going into the subject of Forestry as an expert should have considerable knowledge of mechanical drawing. Then, of course, the subject of Surveying is without doubt a very important subject for a Forestry course, so I have added Surveying to the last year of this course, the same as in the Engineering Course with surface surveying, field operations, etc. Then, in connection with the second year, I have put in the work that is now being given in the Engineering Course. "The Uses and Adjustments of instruments (compasses, transits, levels, etc.) trigonometric surveys, compass surveys and contour surveys. All of which would be designed to give the Forester a knowledge which would enable him to survey a lot of wood land, to make plans of it, and to perform the work in a systematic way.

Now, in the third year, I have put in the following subjects:

First—Chemistry, as in the B. A. course. This will be of little in the matter of the chemical constitution of the forest woods.

Second—Economics. This is a subject of extreme value to consider the matter of trade movements, the effect of tariff rates, etc.

Third—The subjects of the Engineering course, such as the "theory of earth pressure and application to retaining walls, sewers, tunnels, etc." This matter of earth pressure, so far as the retaining walls are concerned, in damming streams seems to have a uniform supply of water, would be a very helpful subject of study.

Fourth—"Foundations," as in Engineering Course. With reference to the bearing power of soils and drainage of foundations, etc.

Fifth—"Road and Highway Construction." This is a subject I noticed in the curriculum of all the forestry schools. The subject of road making and of course that is a very practical one for the forester in connection with intelling at lumbering.

Sixth and Seventh—Subjects of Drawing and Surveying, so far as they relate to matters in connection with forestry.

Eighth—Dendrology (the natural history of trees).

In the *Ninth* I have added the subject of the Diseases of Trees, the causes, nature and remedies. And it has just occurred to me that I might have added the subject of Insect Pests. And going back for a moment to the attitude of the schools towards forestry, I feel that in this Province we shall, in a very few years, be face to face with a very great difficulty in the matter of the Gypsy Moth and the Brown Tailed Moth, which are causing a great deal of destruction in the State of Maine and are marching with a host towards this province. Many trees have been entirely stripped of their leaves by this pest, and I think the people of the Province should be awa'ened to a knowledge of this pest, and be able to stamp it out in its initial stages; and the children of the schools could do a great deal to help along this line; if they had a description of the moth they would be able to recognize it, and could help to kill it out, and in this way a great deal of expen'iture of public money might be saved in the future.

Then, taking up the subjects of the Third Year of the proposed Course again, we have in the *Tenth* subject, the "preservation of timber; lasting powers of various species. Seasoning of wood. Methods of preserving timber." And in the *Eleventh* and last subject, we have "Forest technology. Normal and abnormal characteristics of wood, etc."

Then in the Fourth year, I have some subjects already taught at the University, Meteorology, Materials, Structures, Hydraulics, Geology and Mineralogy. The Sixth is Silviculture. Forest types, modifications under diverse conditions, improvement by good treatment, reproducing forests by skillful cuttings, etc. If lumbering is going to be the removing of the ripe trees from the forest, there is no reason why lumbering should not be a help to the forest instead of its destruction.

Seventh, Forest Mensuration; Eighth, Lumbering; Ninth, Forest Management; Tenth, Provincial Forestry laws and regulations; Eleventh, Elementary law for foresters. Contracts, Damages, Real Estate, etc."

Now, you will notice, gentlemen, that so far as this proposed Course is concerned, all the subjects, except the subjects 8 to 11 of the Third year and 6 to 11 of the Fourth year, are at present taught at the University in connection with the Arts and Engineering Courses there, so that the only subjects needed to be added are the subjects 8 to 11 of the Junior Year and 6 to 11 of the Senior Year. And in order to carry on this Course, I feel that one competent man, such as we might get from one of the recognized Forestry Schools, the Yale School for instance, would carry on, for a time, at least, the work of this Course. I think that at the present time, an expenditure of \$2500 to \$3000 would be sufficient to carry forward the work of a Forestry Course as I have outlined it, and I am sure that so far as the utility of the Course is concerned, the expenditure would be insignificant, compared with the beneficial effect to the Province.

In connection with the completion of this Course, I think some recognition should be given, such as the degree of Bachelor of Forestry and Master of Forestry, as is given in the Yale School. It might, if this Course were to be inaugurated very soon, be practicable indeed, to have a body of students ready to begin on the work at once. The students, having completed the second year of the Arts course, or the second year of the Engineering course, might by a very little extra work, be in condition to go on with this course in the third and fourth years, and graduate with the degree of Bachelor of Forestry.

Now, in regard to the benefit of such trained men to the Province, I think it need not be gone into in detail. However, if it is proposed that the Government shall do anything of value in the way of looking after the forest grounds, it would be well to divide the forest into districts and appoint a competent man in charge of each district to look after it. Now,

these men ought to be trained and must be trained, I believe, if you are going to have such men in connection with our own Province. If you get men outside the Province, they are not interested in the conditions of this Province, and have very little knowledge of the local conditions. Our conditions here are largely local, after all, and have little to do with the conditions in other countries. So I think they should be trained by our local institutions, and would then be sympathetic with and competent to deal with our local conditions in the Province. Then, too, it is not to be expected that our young men will go outside for training in this respect. Experience has shown that our young men will not go outside the Province for this work. In order to induce young men to take up Engineering or other practical work, we must encourage them to gain their knowledge within the Province. The local school has an attraction which no school outside the Province can have.

I feel that I have perhaps taken more time already in explanation of this proposed Course in Forestry than I should. I hope that my motive in bringing this matter before the Association will not be misunderstood, because I feel that it is a very practical one for the Province, that such a Course would be of great practical utility in furnishing trained men in the Province who can deal with the matter of the preservation of our forests in an intelligent way.

*Syllabus of Course in Forestry Outlined in Connection with Courses
Already Established at the Provincial University*

First Year.

1. English: As in present B. A. and Engineering Courses.
2. Mathematics: As in present B. A. and Engineering Courses.
3. French or German: As in present B. A. and Engineering Courses.
4. Botany: As in B. A. Course.
5. Drawing: As in Engineering Course.
 - (a) Round writing.
 - (b) Freehand Drawing.
 - (c) Elements, use of instruments and operations.
 - (d) Lettering.
 - (e) Plane problems, with examples in plane Geometry and Conic Sections.

- (f) Topographical plans and colored topography.
 - (g) Elementary projections.
 - (h) Tracing.
6. Surveying: As in Engineering Course.
- Chain surveying (theory). Methods of chaining and overcoming obstacles; also practice in field operations.

Second Year.

1. English: As in B. A. and Engineering Courses.
2. Mathematics: As in Engineering Course.
3. French or German: As in B. A. and Engineering Courses.
4. Physics: As in Engineering Course—
Elementary Dynamics, Statics, Hydrostatics, The Metric System, Velocity, Acceleration, Laws of Motion, Force, Energy, Momentum, Work, Power, Composition and Resolution of Forces, Moments, Couples, Machines, Properties of Fluids, Archimedes' Principle, Specific Gravity, Density, Fluid Pressure, Pascal's Law, Bramah Press, Barometer, Boyle's Law, Pumps, Siphons, etc.
5. Drawing: As in Engineering Course—
 - (a) Descriptive Geometry.
 - (b) Shades and Shadows.
 - (c) Isometric Projection.
 - (d) Maps of chain and compass surveys.
 - (e) Drawings of tools, machines, and details.
 - (f) Tracing.
6. Surveying: As in Engineering Course—
Uses and adjustments of instruments (compasses, transits, levels etc.)
Trigonometric surveys.
Compass surveys.
Contour surveys.

Third Year.

1. Chemistry: As in B. A. Course.
2. Economics: As in B. A. Course.
3. Theory of earth pressure and application to retaining walls, sewers, tunnels, etc.: As in Engineering Course.
4. Foundations: As in Engineering Course.

- (a) Bearing power of soils and drainage of foundations.
- (b) Pile foundations.
- (c) Foundations under water.
5. Road and highway construction: As in Engineering Course —
 - (a) Stone, wood, asphalt, brick and broken stone pavements.
 - (b) Foundations for roads.
 - (c) Country roads.
6. Drawing: Engineering Course (in part) —
Maps of contours and hydrographic surveys
7. Surveying: Engineering Course (in part) —
Hydrographic surveying.
8. Dendrology (the natural history of trees):
A general biological study of forest trees, especially those of economic importance. The morphological and silvical characteristics of trees. The recognition of trees in the field. Practice in identifying trees and shrubs.
9. Diseases of trees:
Causes, nature and remedies. Fungous diseases. Pruning.
10. Preservation of timber:
Lasting powers of various species. Seasoning of wood. Methods of preserving timber.
11. Forest technology:
Normal and abnormal characteristics of wood. Abnormal characteristics of special value such as laris, bird's eye, and curly grain. Importance of color, gloss, grain, texture, odor and resonance. Moisture, density, shrinking, warping, swelling, etc., and their effect upon the use of timber. The chemical constitution of woods (see 1 above). Mechanical properties, elasticity, flexibility, cross bending, shearing, strength, etc.

Fourth Year.

1. Meteorology:
Climatic conditions and Forestry.
2. Materials: As in Engineering Course
Materials used in steel and timber structures — their elasticity and resistance, tests and inspection of these materials. — Laboratory work in making actual tests.
3. Structures: As in Engineering Course
Steel and timber structures, calculation of stresses in and details of

- truss bridges, plate girders, cantilever bridges, draw-bridges, suspension bridges, and roof trusses.
4. Hydraulics: As in Engineering Course—
Flow of water in pipes, mains, ditches, canals, sewers, streams and rivers. Estimates of water power, water works, reservoirs, sewage system, etc.
 5. Geology and Mineralogy: As in B. A. Course.
 6. Silviculture:
Forest types, modifications under adverse conditions, improvement by good treatment. Reproducing forests by skillful cuttings. Practical silvicultural problems in this country. Successive cuttings. Selection in cutting. Improving forests by thinning. Seeding and planting. Nursery work.
 7. Forest Mensuration:
Methods of determining contents of logs and felled trees. Contents of standing trees. Valuation. Cruising. Age of trees.
 8. Lumbering:
Detailed plan for lumbering a wood-lot. Estimate of various products on the lot. Milling. Local markets. History of Lumber industry. Exporting and importing lumber. Prices. Grading lumber. Protection from fire.
 9. Forest management:
The general principles of the administration of forest property.
 10. Provincial Forestry laws and regulations.
 11. Elementary law for foresters. Contracts. Damages. Real estate, etc.

All of the subjects of this syllabus with the exception of 8-11 of the third year and 6-11 of the fourth year are now being taught at the University. These exceptions could be fairly covered by one competent man, a graduate of one of the leading American schools, such as the Yale Forest School. To procure the services of such a man and to suitably house the school at the University would require an annual expenditure of about \$2,500.00. This amount is insignificant in comparison with the immense benefit to the Province to be derived from a proper knowledge of the scientific principles underlying the forest problem. No Province or State of North America should be more alive to the importance of this question than the Province of New Brunswick.

The Premier invites discussion.

Discussion then took place, participated in by Mr. Robert Connolly, Mr. J. Fraser Gregory, and others.

MR. ROBERT CONNOLLY—I have heard a great many papers read, and very good articles they were; but I have cut the log, and have sawed it, and have seen it go to England; but when you get down to Forestry business I say this: That the Government has at the present time got the very best system that can be placed before this country. You cut the log 10 inches 18 feet—and nothing smaller, and put men in charge to look after that, and look after the fires and you have got the Forestry. And if a man will go along and trim his trees right up to 5 inches, there will be in many cases three logs cut out of a tree. You should not charge a man anything for this because that is the best protection the forest can have. I stand here to tell you, straight and distinctly, that you need to appoint forest rangers to look after the fires. Give us one man on the Bay Shore to go and report every fortnight where he is, and what he is doing, and in case a fire starts up to notify the men who hold the licenses, such as The Bay Shore Lumber Co., and White & Prescott's, and I say those people who hold the licenses should pay one-half the man's salary. Now you are getting down to business and the Government is protecting the licensees and protecting themselves. I think that is practical work as regards looking after the forests. You can go along and educate the people as you like, but there is the whole thing right in your shell, to my mind. What I say is that we ought to have fire rangers. They should be appointed by the Government and the licensees should pay their share, and let them look after the district, and let them report what they are doing, and I do not think you will have very much trouble after that.

MR. J. FRASER GREGORY—I would like to say something that I have on my mind. I am very sorry indeed to see so few St. John lumbermen here today. I might also say that our firm, the firm I represent, does not own nor control one square mile of timber limits in the Province of New Brunswick. Our holdings are all in the Province of Quebec, and while I am a member of the Limit Holders Association, and a member of the Canadian Forestry Association, and have personal interests in Quebec, in Fredericton, here, and in the Province of New Brunswick, my interests would be rather that of a private citizen than that of a lumberman; yet at the same time it might be that I would be interested in timber limits in the Province of New Brunswick. I have looked through this programme and there are two or three things I think have been omitted in it, and I want to call

attention to them, and suggest some ways that to my mind would be the best means to get at the practical side of the question; because, although we are hearing a number of addresses concerned with Forestry that are all proper and right and of inestimable value, still they are generalities in a way. We all know what is being said, that there is a necessity for Forestry protection, that the depleting of the forests is ruining our water power, and depleting our resources, but the question is how to get down to the commercial part of the question, and how to get the dollars and cents out of it. In this programme there is no question of forming an association for that purpose. I think it would be a very good plan to form a Provincial Forestry Association, subordinate to, and to work along something of the same lines as the Canadian Forestry Association, whose scope is much broader. In order to do so, I think it would be a very good idea to have a committee appointed to report back to the Convention. In the whole matter there is no mention made of the pulp industry, and it is that pulp wood industry that is doing the most harm to the Province than anything else. I claim that the pulp industry should be made subordinate to the lumber industry. You cannot prevent a man who owns a farm from selling his wood-lot in the rear to owners of a pulp mill, but from the Crown Land this cutting of pulp wood can be hindered; and with the improved methods there are now of making pulp there is no reason why the pulp mill and the manufacture of pulp should not be a by-product of the saw mills. The wood that comes from the saw mills can be used, and even the saw-dust can be used in the making of pulp. A saw mill might have a pulp mill in connection with it and thus use the refuse wood from it.

Another thing I think needs revising and amending, is the matter of the surveying of lumber. The Act on the Statute Books with reference to the surveying of lumber is as antiquated as log driving itself is in New Brunswick. It deals largely with square timber, of which the Premier told us there was more than forty tons shipped last year. The quantity of feet allowed in logs eleven inches in diameter, is quite ample; but when you come into the smaller size of logs, the table as given is more than any man can saw out of a log. I am manager and represent a milling firm in St. John that has the most modern mill, the newest mill, in St. John, if not in the Province, where we use the finest gauge saws possible. After we have taken the deals out of it, the proportion of slabs and deal ends is smaller than that in any other mill, but we use modern appliances. To get the quantity out of the log that the New Brunswick table gives, is all that we can do and the man who has the old-fashioned tools cannot do it at all. So

I think the matter of the surveying of lumber is a matter that should be taken up by this Convention, and really I think by some sort of small commission, a number of men appointed to look into the scale of logs in New Brunswick as compared with other provinces, and make it so that practical mill men can saw out of the logs the money they pay for in them.

I would move, Mr. Chairman, that three committees be appointed to meet when they are able, and to frame resolutions and to make a report to this body later on, say at the last session to-morrow afternoon, so that quietly and of themselves, a limited number of gentlemen can get together and think out and reduce to writing their ideas and the gist of what they are learning from the different addresses and papers that are being given here. A committee might be appointed to advise as to whether it would be wise or not to form a Forestry Association. Another committee might be made on resolutions alone, or there might be a sub-division, a committee of mill owners, a committee of lumbermen or a committee of different men to move a resolution as to how the Forestry question affects their particular line. The lumbermen have some particular ideas, and the manufacturer of lumber may have some other ideas or the simple merchant or the provision man may have some ideas, but if the three committees are appointed, one to consider the idea of forming an association, another as to resolutions along the line of Forestry legislation from the general public standpoint, and the third a committee of lumbermen to suggest some resolutions from their point of view, you might from the report of these different committees arrive at some result.

MR. W. B. SNOW—ALL.—In rising to second the resolution just made by my friend, Mr. Gregory, I think that the suggestion made in reference to a resolution committee is a very practical one. At the Forestry meeting at Ottawa there were committees there appointed who brought in resolutions the last day, which were discussed and considered. We may meet here now and consider questions arising from the different papers, read and arrive at no definite conclusion, or not ascertain the feelings of the lumbermen and other gentlemen associated here, so as to come to any conclusion. I think it therefore is advisable to have a resolution committee, to be named by the chairman and then we might arrive at something definite.

I would like to say that I was fully in accord with what the Chancellor of the University said in reference to education. We have not in our province today gentlemen thoroughly conversant with the Forestry question. They are not trained along the lines set out in this paper presented by the

Chancellor, and therefore, if we do want men, we have to go outside the Province and bring men from the United States or from Western Canada, who are not conversant with the needs of our Province. What we want is men who know our Province and the forests about here, who know the shipping, are conversant with the trade and the necessities and what is wrapped up in the lumbering trade. We do not want to import strangers who are not in sympathy with the needs of the country, but rather should take our own young men, who will be thoroughly in sympathy with what we require in this Province.

While we are dealing with this matter I would state that I would like to see joined with that University course, a short course, of say two or three months of the year, where the sons of lumbermen could get some of this training in a short time. We are a hard working class of people and I think if a young man is going into the lumbering business he should get into it when he is 17 or 18 years of age, as up to that time they would probably be unable to take the full technical course which is laid down and which to some extent they do not fully require. They, however, need something of the course which is mapped out and if in the summer, say two or three months, they could take advantage of this particular course, it would be of great benefit to them in maintaining the lumber interest and looking after their business successfully. I know it would have been of great benefit to me if I could have obtained something of the course which Chancellor Jones has mapped out. I therefore would like, if such a course is started at the University, that in connection with that, a short course should also be arranged, where a young man could go in and not perhaps take the degree, but get the information and the necessary practical and theoretical knowledge that is laid out in this very extensive course. I hope that such a course will be adopted by the University and assisted by the Government, through the Department of the Surveyor General, as I think it is a most necessary thing to have young men trained who can take positions in the lumbering business and made thoroughly capable to carry on the lumbering business of the Province.

The Premier announced the following committees as appointed under Mr. Gregory's motion No. 1:

Committee on Forestry Association

Hon. F. J. Sweeney,

Hon. C. N. Skinner.

Hon. J. P. Burchill,
 Mr. C. K. Lund, D. L. S.,
 Mr. David Richards,
 Mr. James Beveridge.

Land Women's Committee

Mr. J. F. Gregory,
 Hon. G. Hutchinson,
 Mr. Henry Hilyard,
 Mr. W. B. Snowball,
 Mr. A. H. F. Randolph,
 Mr. F. E. Syre,
 Mr. Fred Arkelson,
 Mr. D. J. Lockley.

Non-Lumbermen's Committee

Hon. A. R. McClellan,
 Mr. J. D. Hazen, M. P. F.,
 Mr. C. M. Logore, M. P. F.,
 Hon. Geo. F. Hill,
 Dr. Geo. F. Hay.

Dr. Inch, Chief Superintendent of Education, N. B., then read the following address:

ADDRESS OF DR. J. R. INCH,

Chief Superintendent of Education.

Mr. Chairman,

It is characteristic of the spirit of the age in which we live to look to the schools for the promotion of every movement intended to benefit the human race. There are some who still think that the teaching of the three R's should be the limit of public school instruction. And yet the farmer, the lumberman, the merchant, the mechanic, the professional man, the social reformer, the religious teacher—and even the military leader—all in turn demand that the special interest which each has most at heart shall be impressed on the minds of the rising generation by the teachers in the public schools. This universal call made upon the schools is a splendid tribute to the power of Education. And yet what a herculean task is thus



W. A. B. N. G.

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placed on the teacher, and what Protean forms his teaching must assume. This demand is reasonable within limits; for it must be admitted that the training of the child at home and school determines the direction of the man's energies in later years. The oft-quoted lines of Pope may be appropriately recalled at a Forestry Convention:

"His education forms the common mind,
Just as the twig is bent, the tree's inclined."

What can the public schools do to promote the interests which this convention has been called to consider?—that is, to conserve and increase the forest wealth of the country? The Chancellor of the University has already answered this question. The speaker who is to follow me is to deal with that department of the public school work which is most closely connected with forest life and products. Coming between the two I find scarcely sufficient matter for even a brief address.

Before attempting an answer to the question, what can the schools do? I will briefly explain what they have been doing, and what they are now doing, with greater or less success:

In every grade of the common schools, through a course extending over eight years, several hours a week are devoted to Nature lessons. The observation and study of plant life constitutes the largest part of these studies. The children are brought into the closest possible relation with Nature, and are encouraged to observe and examine for themselves her wonderful processes, to note the growth and development of plants, shrubs and trees, and to keep a record of the phenomena which come under their notice. The results of these Nature Studies will be more or less effective and valuable in proportion to the ability and enthusiasm of the teacher.

The other effort made by the Board of Education in direct line with the work of the Forestry movement, was the establishing of what is known as Arbor Day. For twenty years past one day has been set apart in the Spring of the year for the purpose of beautifying the school grounds by the planting of trees, shrubs, and flower beds. In a few cases the results have been satisfactory. Perhaps in all cases some good influence has been exerted upon the minds of the young who shared in these efforts. But in the great majority of cases the trees and shrubs planted have afterwards been neglected, so that before the next Arbor Day they were dead and the work had to be begun anew. The failure has arisen principally from indifference and lack

of cooperation on the part of parents and employers from neglect to encourage the grounds etc. to assist the teacher by labor or team work when necessary.

Having thus sketched what the schools have been doing to do, permit me to indicate briefly what more I think it possible to accomplish and the proper method to pursue.

1. In the first place let us keep in mind the age of the children attending our common schools— from 6 to 14 or 15. Economic considerations do not at that age appeal to the young with paramount force. But the school years are the years in which curiosity and imagination are the keenest. An awakening and cultivating an abiding interest in our forest trees, the wonderful and the aesthetic rather than the economic are the emotions to be excited. The boy or girl is brought into the presence of a noble tree whose spreading branches and towering height excite his admiration. Begin to speak of how many feet of lumber might be cut from its stately stem, and how many dollars the lumber would bring in the market, and he shows indifference, if not dissatisfaction. He has not yet reached the age when the Almighty Dollar is the strongest incentive to action. But when you lead him to follow out the wonderful processes of vegetation which have produced from a little seed this gigantic growth— of the forces locked up in the soil and atmosphere which operating silently and undesired, without haste and without rest, for scores and hundreds of years have by slow degrees covered the earth with magnificent forests, you have awakened in the boy's mind and heart ideas and emotions which will give direction to his studies for the remainder of life. As he grows to manhood and enters upon the activities of life the utilitarian and economic aspects of the study will be developed.

Nature Study in the schools is yet in its infancy stages, but as our teachers become better prepared for this work through special training, richer results will follow their efforts. We are working in the right direction. With encouragement from parents and school officials much more will be accomplished than we have been able to accomplish up to the present.

One means of aiding in this work is to provide the teachers with accurate information in regard to the forest resources of the Province, in regard to the best methods of preventing destruction of our forests by fire, and the most effective way of fighting the fires of the forest in the form of pamphlets. Books containing such information should be supplied at the expense

to the teachers, and others from the Agricultural Department. Pupils should be fully instructed among the schools.

More should be made of Arbor Day. The children's parents should act in conjunction with the trustees and ratepayers in determining to give time and effort to the propagation of Arbor Day. Let the children be made of the school grounds should be enlarged. A part of the grounds should be reserved for use which would furnish a place for lessons not only to the children, but to the community at large. The school house and grounds should be the most attractive place in the district, and the school should be made of a place generally desirable.

1. The first aim will then be the question, "What can be done to promote the objects for which this Convention is assembled?" There is this:

1. From the earliest school age, aim to cultivate in the children an abiding interest in the vegetable life, and especially in the trees surrounding their homes.

2. The means of awakening and cultivating the interest is by appealing directly to the intellect, and to the imagination of the child.

3. Within this regard, have a proper regard for vegetables as well as animal life, and especially to guard against injury to or destruction of trees through neglect, carelessness, or carelessness. Special instructions upon the danger of setting fires near graves or forests should be constantly inculcated.

4. Place at the disposal of the teacher the reports and bulletins of government bureaus and such other publications as will supply full and accurate information in regard to the forest wealth of the country, and the measures taken in other countries to promote similar interests.

With such aids to instruction the teacher will not find it a difficult task to inculcate valuable lessons, and to awaken in the child's mind an abiding interest in trees. In fact the love of graves and trees seems to be intuitive. Some of our ancestors were tree worshippers. From the description of the Garden of Eden by the Book of Genesis to the latest publications of the poet, the novelist, and the historian, literature is full of references to trees.

It is a pity that in New-France, like in other countries, there has been little practical attention to the forest wealth, and that our government has

famous as he lifted up an axe against the great trees. Let us hope that under a wiser policy nature will be given an opportunity to repair, as far as possible, the ravages caused by the improvidence of the past, and to reproduce trees at least as fast as the necessities and interests of men require the removal of those which now flourish in our forests.

Mr. T. B. Kidner of the Provincial Normal School, Fredericton, then addressed the Convention:

T. B. KIDNER

Director of Manual Training, N. B.

The part played by the Manual Training Schools of New Brunswick in this important matter now before the Convention is not, perhaps, a very large one, but I venture to think it is of sufficient importance to bring before your attention this afternoon, and that, for two reasons. The first reason is that as I understand it, one of the chief objects of this Convention is to arouse an interest in these matters and that is one of the things we are attempting to do with the children. Secondly, in the Manual Training schools we are dealing with the pupils at a very plastic time, when very lasting impressions will be made upon them and we must remember that they will have to deal with this question of Forestry when it becomes a much more acute one a few years hence.

We have some twenty Manual Training schools in the Province of New Brunswick. They are not, I may say, Manual Training schools of the type now so familiar in the United States—the Manual Training high schools of the cities. We have not yet any Manual Training high schools. We have, however, departments of Manual Training in connection with the common schools and they are attended chiefly by the boys of grades VI, VII, and VIII, the highest grades in the common schools, that is to say by boys from eleven or twelve to fourteen or fifteen years of age, a most important age from an educational standpoint. In some few instances the high school pupils attend the Manual Training schools, but the high school manual training is merely incidental and we have no regular manual training in our high school course at present.

The boys, from these upper grades I have mentioned, spend half a day each week in the Manual Training room and there they make articles out of

wood from working drawings previously prepared by the boys themselves, not with a view of making them tradesmen, not from any vocational aim which we may have in other schools of somewhat similar type, but merely from an educational standpoint, a standpoint recognized by educationalists and men of affairs alike today. That is to say that an education which consists entirely of the study of books does not fit one for the work of this world and the demands that will be made upon the men and women of the future. Therefore we carry on this work, not with any idea of preparing the children for particular trades, but to develop them in the broadest way and to give them an all-round training so as to reach that side of their nature not reached by books.

Side by side with this instruction in drawing and tool work there is given at every session a brief lesson dealing with the properties of the materials they are using. The lesson takes the form of what educationists know as an object lesson, that is to say, a lesson illustrated with specimens and by experiments. As many as possible of these are given in the course, which is carried on for about three years.

I prefer the term which we give in our training course to our object lessons, viz., "General Intelligence Talks," for that is their aim to arouse the intelligent interest of the children in the materials they are using and to enable them to understand the principles involved in construction. To this end we have arranged a series of lessons, a brief schedule of which I shall present to you in a moment and these are carried out, as I have said, at every session of practical work. The boys spend one-half day per week in this practical work, during which they are excused from the ordinary studies. They make their working drawings and then construct some article of wood and are given this object lesson, this scientific demonstration of the properties and the characteristics of the materials they are using, side by side with the bench work. The schedule of lessons is as follows, but I am leaving out of this the lessons dealing with materials other than wood—the metals and the glue and the other materials that are dealt with necessarily in the shop work.

SCHEDULE OF LESSONS ON THE TREE, ETC.

The Timber Tree —

1. How it grows.
2. The three broad divisions: bark, sapwood and heartwood.
3. The annual rings; their divisions and their formation.

4. The pith rays and their uses:
 - (a) In the growing tree.
 - (b) In the wood (quarter figure, etc.)
5. The leaves and their functions.
6. The effect of trees on climate and on the health of a community.
7. Fibres and cells (microscope).
8. Felling.
 - (a) Good and bad methods.
 - (b) Time of felling (proper season and age of tree).
9. Conversion (methods).
10. Seasoning. The necessity for it and the several methods adopted.
11. Warping and shrinking.
12. Quarter cutting.
13. The faults and defects of lumber. — Sapwood, large or dead knots, shakes, worm holes, rot, etc.
14. The classification of woods.
 - (a) By the trees (broad-leaved and needle-leaved).
 - (b) By the nature of the wood.
15. Our chief native woods.
16. Our wasted woods.
17. The properties, characteristics and therefore the uses to which the various woods are put. "Uses follow properties." Various properties, such as stiffness, toughness, pliability, hardness, durability, beauty of grain, evenness of texture, etc., etc.
18. The strength of wood (by experiments and in the design of joints in construction).
19. The preservation of wood. — Paint, oil, varnishes, etc.
20. Field walks: visits to mills, cabinet and furniture factories, timber yards, etc.
21. The collection of specimens of leaves, fruit, wood, etc., of our native and other trees.

The foregoing numbers do not refer to single lessons. Obviously such a lesson as No. 17 would be too much for several lessons and is, in point of fact, spread over the workshop practice of two or three years.

I said a moment ago that we did not believe in mere talks and therefore, with your permission, I should like to illustrate for a few moments just the sort of lessons we give and the way in which I venture to submit that we may arouse and do arouse an interest in the minds of the coming generation

in this important question of the trees. We commence with a few lessons on the growth of the timber tree and I have here a number of specimens taken from those in daily use at our training courses in the Normal School. On this board are shown several sections of timber trees of various types, dealing with the softest and hardest wood. The specimens on that board are intended to show that the timber tree grows outwardly by adding a layer of wood each year in temperate climates. That leads us to the rings and the study of the way in which the rings of growth are formed and their effect on the grain of woods. With a cheap microscope very much interesting work can be done just in the study of the growth or formation of the annual ring. We go on then to the study of the pith, or medullary rays, taking, perhaps, a piece of oak or maple, or some other wood which has the medullary rays well defined, dealing with the effect of the rays in the growing tree and also their effect upon the wood, chiefly from the point of view of the beautifying of the wood when it is quarter cut and exhibits the rays in their full beauty. Later on we have to consider the effect of the medullary rays upon the shrinking of the wood, and that is very important, as they have a great effect in the changes of form occurring during seasoning.

Then we take up the leaves and their functions, about which I need not say much, but of course the effects of trees on the health of a community are taken up in lessons on the functions of the leaves. We deal, of course, chiefly with that beautiful function of the leaves to take in certain things from the atmosphere and give out pure air in their place. Then we go on to the consideration of the fibres and cells that make up the wood, and that gives us an opportunity for microscopic work, and very many beautiful sections can be made and are made by the boys for use under the microscope in studying this important part of the subject.

Then we get very many interesting lessons on the felling of trees, and in those lessons we are assisted very materially by the excellent publications of our own Forestry department and the Forestry department at Washington, all of which are placed at our disposal by getting on their mailing lists.

We next take up seasoning: not only the method of seasoning, but the reasons why lumber should be seasoned. That is, of course, full of interest and practical importance. We next deal with warping and shrinking, and we get some very interesting lessons by obtaining from some of the lumbermen the butts of green logs, putting them in well heated rooms and watching what goes on in the course of a year. The warping and shrinking of a

board, and the reasons for quartering valuable logs before they are allowed to dry, can be taught very easily by demonstrations of that sort; not by mere telling, but from actual observations of what goes on under the noses and eyes of the children right in the room.

We then go into the faults and defects of lumber; not from the book point of view, but from the point of view of the wood pile in the corner of the school room; because the boy makes his working drawing, calculates the amount of lumber that he will have to cut out from which to make his article, and then goes to the rack and selects it himself. Therefore our first lessons are devoted to the commonest defects we find; for instance, the defect of sapwood, which is one of the commonest we meet with in several of the woods. Then there are other defects shewn by the specimens here, such as rot, sapwood attacked by insects, while the sound heartwood is left; large knots, loose knots, dead knots, the various forms of shakes, worm-holes, etc. Then comes the classification of the trees, first, by the trees, and second, by the nature of the wood. Most of our boys know the names of the trees and can identify them, although even here in New Brunswick, surrounded as we are by forests, the boys are growing up in many of our towns without any knowledge of that sort of thing and cannot identify our commonest trees. Then the study of our chief native woods gives us an interesting set of lessons, as does also the study of our wasted woods, which I consider very important. Only last week I was speaking to our students of an advertisement which has been running for some time in an American paper, asking for orders of beech logs. The advertisers cannot get them in their locality, while we are burning many tons every year. Then the properties, characteristics and, therefore, the uses to which the various woods are put, open up a very interesting field. We can take a boy's work bench at school and find that a dozen different kinds of wood have been used in the construction of that bench and the different tools he has upon it. These different kinds of wood are not used hap-hazard, but every object is made of some wood that is suitable for it because of the characteristics it possesses.

Next we deal with the strength of wood; but it will, of course, be obvious that in a ten or twenty minutes' lesson we cannot go very far into that subject. We must leave that to the University and higher institutions dealing with it from an engineering point of view; but we can and do perform some very interesting experiments dealing with the strength of a piece of wood.

The preservation of wood. That we do not go into very deeply, beyond teaching the boys a little varnishing, shellacing and polishing, and a little about painting.

The field walks form a very important part of the work in many of our manual training schools, especially in the consolidated schools, where the field work is followed out in connection with all their studies. I have here some leaves collected by the boys, and all these folios I have on the table were sent down by the Woodstock Manual Training School, which is typical of the rest of our schools. These leaves are collected by the pupils, and that means an interest in the trees and an interest in the walks also. Visits to mills, cabinet factories, glue factories and places of that description are also made and serve to lend additional interest to this side of the work. Where we are fortunately situated near a lumber yard we often get a great deal of help. In some towns the merchants have gone out of their way to assist us; regular classes are arranged for, and the instructor is allowed to take the pupils through the mills and someone is told off to guide them through, and thus a very profitable half day is spent in that way.

Then the collection of specimens for the schools is another important part of the work. You would be surprised at the number of different woods the boys will collect. I was called on the other day to judge of collections made by the boys, and one boy had over one hundred different varieties of wood in his collection. Of course he was situated near the coast, and he had a whole lot of Southern woods in addition to the commoner native woods. As I say, he had over one hundred varieties, and as far as possible he had named them and had looked them up in whatever books were accessible to him, and in a general way had acquired a good deal of information by the mere collecting of these specimens.

As I remarked, our chief aim is an educative aim, and these lessons are carried on side by side with the lessons in drawing and bench work, chiefly with the view of making the boy's bench and tool work more intelligible to him. That is their main aim; but in a secondary sense I believe they have an important bearing upon this very much larger question now before us, and I present, therefore, as our contribution to this large question the little that we are able to do in a secondary way in our public Manual Training Schools towards arousing some interest in this most important, this vital, question to us in Canada of the conservation and preservation of our forest wealth.

NOTE. Mr. Kidner's address was illustrated by numerous interesting specimens from the museum of the Manual Training department at the Normal School, Fredericton, and other Provincial schools. One case showed the growth of a timber tree and served to illustrate the early part of the schedule of lessons. Another case included examples of the commoner defects of lumber, others showed many beautiful specimens of our native woods and of many other woods of commerce. Specimens of the largest pine needles known, (*pinus coulteri*) from the Himalayas, cones of the Norway spruce, etc., etc., were also exhibited. Mr. Kidner explained that they were useful for comparing with our own pine needles and spruce cones, and said there was no limit to the interest which could be aroused in this way amongst the pupils. A fine piece of California redwood was shown mounted on a panel and surrounded by photographs of famous redwood trees, logging operations, etc. A collection of Hough's sections also evoked much interest.

Lt. Col. Loggie, of the Crown Land Department, Fredericton, read the following paper:

T. G. LOGGIE.

NEW BRUNSWICK FORESTS.

From its earliest history the products of the Forests of New Brunswick have held a first place in its trade exports. Although a large section of the Province is admirably suited for Agriculture, particularly the magnificent intervalees of the River Saint John, stretching almost from its Mouth upwards to the limits of the Province, a distance of 300 miles of the Miramichi, Kennebecasis, and other valleys; the broad, salt marshes of the Upper Bay of Fundy, still Lumber has remained King.

New Brunswick contains an area of 17 4-10 millions of acres. Of this average 9 millions are granted lands, and 8 4-10 millions, as nearly as can be ascertained, are Crown Lands, and the Province is everywhere drained by large rivers with innumerable branches, almost locking each other at their sources.

It will thus be seen that lumbering can be carried on advantageously, as one has yet to find a section of the Province where logs cannot be cut and driven down these waterways to market. Of these rivers, the St. John is

the largest and drains nearly one half of the Province. Next in importance is the Miramichi, its watershed embracing about 5,600 square miles.

The settled portions of the Province are principally along the river valleys and coast line; the interior forming one vast timber preserve, and embracing a territory 80 miles wide and 100 miles long without a habitation of any kind save the lumberman or trapper's shanty, and no sound except the ring of the woodsman's axe or the call of the hunter. Here is a domain fairly free from the ravages of fire and timbered with all kinds of valuable lumber. The greater part of this territory is unfit for cultivation, lying on the granite and boulder formation, although the northern section in its approach to the Restigouche River, runs into the Upper Silurian belt, and consequently has good deep soils. Everywhere over this belt both black and white spruce abounds, some pine, and vast quantities of the hardwoods that have scarcely been touched, also large quantities of the finest and largest cedar in Eastern Canada.

Leaving this section of the Province and turning our attention to the country lying southerly and south-westerly of the S. W. Miramichi, and extending to the Bay of Fundy, we find a territory heavily cut, and, in places, badly burned. The Nashwaak River is an exception, where Alexander Gibson, our lumber king, still reigns supreme.

FOREST FIRES.

In reading reports from time to time of the timber domain of Canada as well as of the United States, the same story is read and re-read of the devastation by forest fires. New Brunswick has not escaped. The great Miramichi fire that swept through this Province in the year 1825 is a matter of history. Scarcely a year elapses without more or less fires, although, of late, we have suffered less perhaps than our neighbors.

Our Legislature and lumbermen have grappled for years with this great question, and the Government has still under consideration more effectual methods in checking the ravages of forest fires. In the year 1885 the Legislature passed the Act now in force. It contains provisions prohibiting fires from being set between 1st May and the 1st December, except in clearing land, obtaining warmth, or necessary industrial purposes, and then precautionary measures to be taken. It is the opinion of many that no fires should be set at all, except under a written permit from the Fire Warden of the District. No fire to be set in the forest without first clearing away a

spot five feet around where the fire is to be set. The Act provides that lumbermen shall call their crews together, read the Act, and warn them as to setting of fires.

The Railway Companies are required to provide their smoke stacks with a bonnet screen interwoven at the draught with wires (three times as many wires for wood as for coal), and section men to pass over their sections once a day. The right of way to be cleared of all combustible material. A further Act provides that \$2,000 can be expended in any one year in carrying out the provisions as enacted. It is the opinion of many that while the provisions are to a large extent admirable, this Act can only be carried out by a well-selected Corps of Foresters, or Fire Wardens, permanently employed by the Province, and along the same lines as regulations of the Province of Ontario. These wardens could act as sealers of lumber, Fishery and Game Wardens, Labor Act Commissioners, and in other capacities of a public nature. The outlay for such a service would no doubt be large, but the results would be far-reaching, and in the best interests of the Province. There is no question in New Brunswick today of more importance than the preservation of the forests in respect to the setting of fires.

The total area remaining in the possession of the Crown, as stated at the outset, is in the vicinity of the 8-10 millions of acres, of which quantity 6-1-2 millions are under timber license; the remaining 1-1-2 million acres or more being to a large extent burnt and barren lands.

Licenses from the Crown are issued annually, but there is an understanding they will run to 1st August, 1918. The stumpage on spruce, pine, fir and cedar is \$1.25 per M. S. Ft., and the yearly rental is \$8 per sq. mile.

The average annual cut for the last five years has been 120 millions of S. Ft., classified as follows:

Spruce and Pine	95 Millions S. Ft.
Cedar	15 " "
Hardwood	4 " "
Hemlock	3 " "
Fir	3 " "
Total	120 " "

Twenty-six sealers are employed to survey this lumber. There is a chief sealer in addition, whose duty it is to oversee the sealers under him, and report to the Department the various operations being carried on and the probable cut of each operator.

There are restrictions in the licenses as to the cutting of undersized lumber, and no tree is supposed to be cut down that will not make a log 18 feet long and 10 inches at the small end. The Government have at various times been strongly pressed to allow undersized logs to be cut for pulpwood, but so far these requests have been met with refusal.

In some sections where spruce has been found to be of a stunted or slender growth, and would never mature to saw logs, the Government have allowed the lumber to be removed, but the quantity so cut has been small.

In administering the Forests of the Crown, one of the greatest difficulties met with is to guard the Department against fraudulent applications for land under the guise of settlement. The tendency in applying for settling lands is to secure a lot sufficiently timbered so as to allow the settler something at the start he can turn into money, either by cutting the logs himself or selling his chance to someone else, which is directly contrary to the provisions of the Labor or Settlement Act. The greater number of those applying have no other motive than to cut off the lumber and then allow their applications to lapse.

The Department is continually holding up applications where reports have shown the lands are unfit for settlement. The licensees naturally protest against such incursion into their limits, and the Surveyor-General is left to adjudicate the matter, often to the displeasure of the settler or the licensee.

A common practice is to squat upon Crown Lands, without application, clear a small portion, and erect a hut. In time the Department is forced by some settling conditions to approve his application, although, in many cases, the location is made among the best timber.

One can easily see the result. The cleared portion must be burned, and the surrounding forest is at once placed in jeopardy.

The separation of the purely agricultural tracts from the lands only fit

for timber growth is, to my mind, one of the greatest needs in our forests today. I have reference to lands at present only in the vicinity of settlements. Such an undertaking would, no doubt, involve a large expenditure. Only persons should be employed for this work, whose assignment could be relied upon, as thoroughly competent in judging the soil. Following this up with a corps of competent forest rangers, for keeping down fires and supervising the cutting is the first essential to the preservation of our forests.

PRIVATE OWNERSHIP OF LANDS

Of the lands that have passed from the Crown I will only deal with those of the largest tracts. The Grant to the New Brunswick Railway, for building a narrow gauge railway from Fredericton to Edmundston, a distance of 167 miles, was 1,047,772 acres, and embraces lands principally on waters tributary to the River St. John, and including parts of the Counties of York, Carleton, Victoria, and Madawaska.

Mr. W. T. Whitehead, the Company's agent, has given us the following estimate of the quantity of lumber in these lands:

Spruce	.....	.....	.....	3,014	Millions S. Ft.
Fir	.....	.....	.....	3,014	" "
Hardwood	.....	.....	.....	47,631	" "
Cedar	.....	.....	.....	496	" "
				<hr/>	
Total	.....	.....	.....	71,155	" "

Of this large tract, the Company has sold only 600 acres. Fully one-third is situated on the Upper Silurian formation, representing some of the best settling lands in the Province, but the policy of the Company is not to sell any for farming purposes, and the progress of that section of the Province is consequently retarded.

It has been proposed that the Government should buy back the settling portion of these lands, which, if accomplished at a reasonable price, would, in the opinion of those who have studied the question, be productive of great results.

The next largest ownership is that of the American Lumber Company, which holds the fee simple of upwards of 225,000 acres, located principally on the Nashua River, and absolutely controlling the lumber trade of that

river. Mr. Gibson purchased the greater part of these lands in the early sixties, and he has been cutting them ever since without a break.

The growth is nearly altogether black spruce, which rotates about every ten years, in cutting down to merchantable logs.

In a conversation I had with Mr. Gibson some ten years ago he estimated these lands as worth to him twenty dollars per acre. It may be understood, however, that any such high valuation can only be explained by the peculiar advantages possessed by the owner. 1,200 millions of spruce have been cut on this property since Mr. Gibson's purchase, and judging from reports the lands today are fairly abundant in spruce.

It may be mentioned here that as much as 20,000 sup. ft. per acre of spruce has been cut in choice bits of this property.

In this connection I may mention the cut of a block of 3,000 acres I purchased on the Keswick River in the year 1887—a tract not particularly well timbered at the time, but fast growing black spruce. In that year I got the stumpage on one million ft.; again in 1892 it produced two million ft. more; again in 1900 the operator paid me stumpage on two million ft. more. In 1908 I am looking for a further crop of two millions. It is a well-known fact that where light and air are allowed in by cutting out the larger logs the growth is much quicker. So much then for the old Scotch proverb:

"The eye stickin' in a tree,
It'll be growin' when ye're sleepin'."

These logs were all chopped down with the axe, but in future operations the saw only will be used, as it is estimated that trees fawn down turn off from 5 to 10 per cent. more scale.

The lands of Mr. Gibson have not been subject to much forest fire, partially owing to the distance from railway lines, but more particularly to the vigilance which the owner displays in dry times.

Another large tract is that located on the upper waters of the South West Miramichi, embracing an area of 160,000 acres, which I understand has lately passed into the hands of an American syndicate at a price of upward of \$6,000,000. The timber growth is much the same as on Mr. Gibson's property. The owners of the land are displaying great interest in holding on to the removal of logs, which are piled off upon the banks of the

diameter at the small end and the top log used for pulp wood. It is becoming more apparent that more conservative methods are being insisted upon in removing the whole of the tree from the forest and thus reducing the risk of fires.

SURVEYS OF TIMBER LINES

No timber lands can be properly managed without a system of carefully prepared surveys and block timber lines, as well as accurate maps.

Generally speaking the Crown Lands are blocked off into areas of six square miles, the lines running astronomical north and south and east and west two and one-half miles each way.

On some rivers blocks are laid off five miles each way and in the Restigouche County the blocks are as small as 1000 acres. The practice is to run the base lines five miles apart and large expenditures have, in this way, been made by the Government. The subdivisions of the licenses are surveyed after first getting an order from the Crown Land Office, accompanied by a plan showing in detail previous lines run, while the order contains a description of the lines to be surveyed. All these surveys have been made by blazing lines through the forests, with the ordinary compass.

The system is open to considerable objection but it is found practically to satisfy those whose interests are involved.

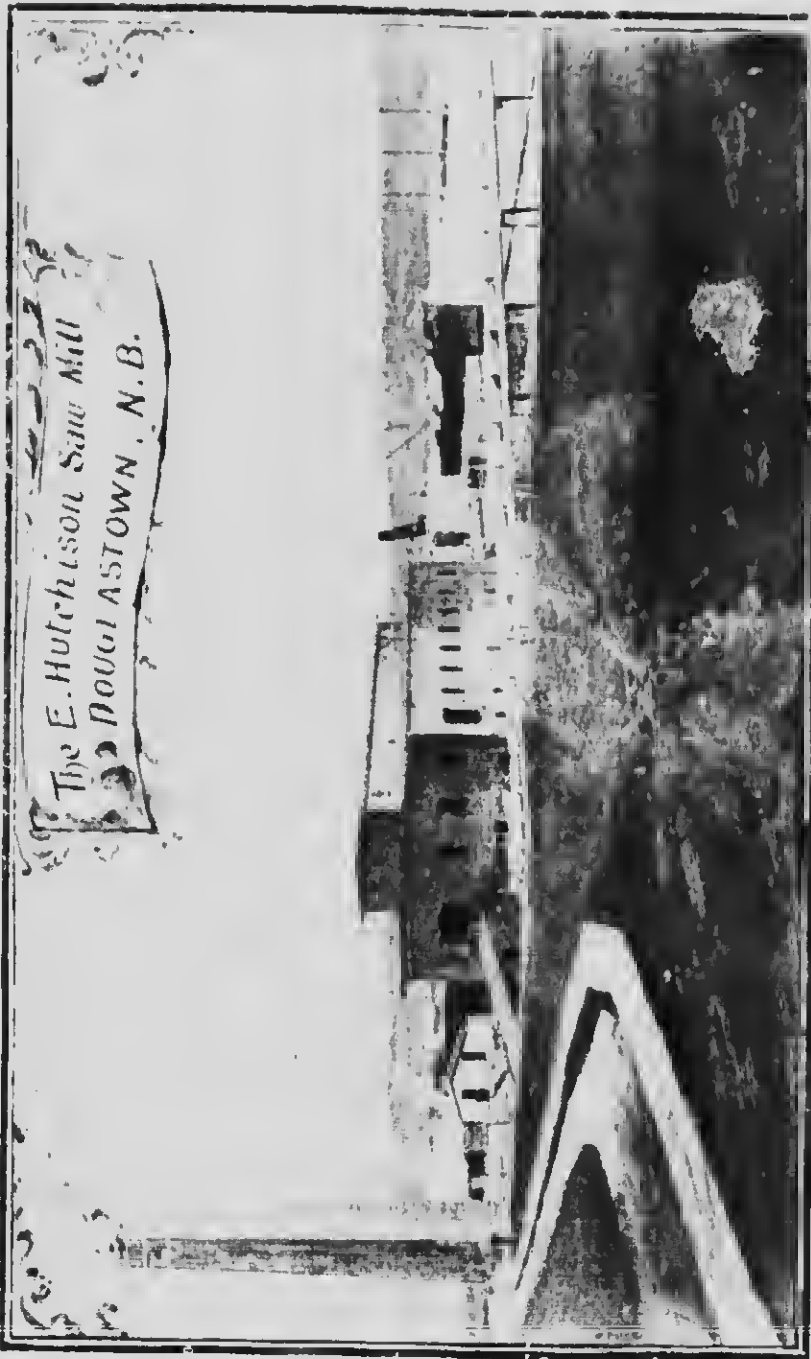
A recommendation has been made to erect iron monuments at the corners of blocks, it being found that corner posts soon decay or are swept away by forest fires.

VALUES OF TIMBER LANDS

My experience would warrant the statement that timber lands have doubled in value within the last ten years.

For the right to cut on Crown Lands stumpage, in addition fairly good timber lands would be worth \$200 per square mile and first class lands \$500 and over a square mile, according to location. The price of soil right lands has probably increased in the same proportion, prices ranging from two to five dollars per acre, although some properties have lately been sold much above these figures and running as high as ten dollars per acre for prime black spruce lands, easy of access and comparatively free from fire danger.

The E. Hutchison Saw Mill
DOUGL ASTOWN, N.B.





In summing up this paper I would recommend :—

- 1st. More effectual means for the protection from forest fires.
- 2nd. The separation of timber lands from agricultural lands.
- 3rd. A carefully selected corps of permanently employed foresters.
- 4th. Restrictions as to the cutting of undersized lumber and the removal of top logs.

Perhaps I may be expected to add reforestation, and while much can be said about tree planting I am of the opinion our efforts at present will be better met by a more efficient preservation of our forests and more careful cutting of the standing timber.

New Brunswick has yet a noble heritage in her forests. Let us then work together to preserve this heritage, so that we ourselves and future generations may reap the benefits which nature has so lavishly bestowed.

In conclusion, again, let us not forget the old Scotch saying :—

“Be aye stickin’ in a tree, it’ll
Be growin’ when ye’re sleepin’.”

Mr. H. B. McMillan, of the Yale School of Forestry, read a paper.

H. B. McMILLAN, B. S. A.,
Yale Forest School

FIRST METHODS OF FORESTRY

So much more has been written concerning the why than the how of Forestry and so many reasons have been advanced for the protection of forests without an accompanying explanation of this protection that a short general discussion of the first steps taken in the establishment of a forest policy in a country previously without one seems to be in order.

For our examples it is better to go to the United States than to Europe since their problems are more nearly like ours and since our solutions, owing to similarity in lumbering methods, labour conditions and market facilities, must closely resemble those of our Southern neighbor.

Our Canadian forests because of their widespread extent are exposed to

very many ravages and to much mismanagement, and there is such a dearth of exact scientific information concerning them that the fundamental operations upon which a Forestry policy may be founded, elaborated and executed may be separated into three main divisions, all necessary and inter-dependent—Legislation, Investigation and Management.

The first and most important, legislation, need only be mentioned here. It comprises the constitution of an executive officer or commissioner having full control of the Provincial forest lands, the government, use, and administration, with the power to employ technically qualified men as administrators and advisors, as well as with the framing of such laws as will guard against trespass and fire, and will furnish the necessary machinery for enforcement.

The States, which have grappled with the problem have found the following plan most practicable. The Governor appoints a Forest Reserve Commission, which might in New Brunswick be represented by the Surveyor General, Attorney General, Chancellor of University, an active and practical lumberman and a citizen interested in Forestry. These men have the power to govern, use and protect the forest lands. They appoint a technically trained forester who also is chief fire warden, and who is responsible for the efficiency of local fire wardens, the administration of public lands, as will be explained in this paper, the delivery of public lectures, and the conducting of a course in the State College. Such a policy is now adopted by the most progressive states of the Union.

This legislation is all Forestry and is one of the most essential parts of a forester's business, and upon it has depended the success of forest policies in different American states.

The question of investigation, however, is one less generally understood though it is the basis of Forestry. Investigation may be of two kinds, that of an exploratory nature, chiefly concerned with exploitation; and that carried on in connection with mechanical and chemical laboratories, manufacturing plants and railroads.

Of the exploratory studies, one of the first must be to differentiate the agricultural from the non-agricultural lands and the protective from the non-protective forests. Those which are not agricultural because of their poor soil, broken character, or rocky nature, and those which are protective because of their influence on water sheds and situation at the headwaters of streams important to agriculture or commerce should be retained

in the possession of the state as forest reserves to be managed conservatively by the state so as to produce a yield of timber which will support a permanent timber industry, not one of unslack growth and short duration as was that of the lake states.

In order to do this intelligently the land and timber must be studied carefully. This work is usually done by a small party under the direction of a forester. The method of procedure in a mixed forest is to run survey strips through the forest at regular intervals which constitute in area about 2 to 5% of the stand, and on these strips all mature and immature trees are counted and measured, and where ties, poles or logs are the customary local product they also are counted and entered upon the tally sheets. After a little experience the work can be done quite quickly, speed varying with the amount of detail required. At the same time the topography is carefully mapped, drainage, slopes, swamps, ridges, and all features which can effect lumbering are noted so that when the survey is complete a relief map may be presented according to which local operations can be planned, camps and trails located.

If the timber varies but little in composition as does the spruce of the north woods here, and may be differentiated into three or four types, operations are simplified. The chief of the party, who must have had sufficient woods experience to have matured a critical judgment, selects a large number of sample acres scattered over the tract, characteristic of the stand of each type and on these sample acres all trees are carefully counted and measured as before.

Whether the survey is conducted on the strip or sample acre method average trees of the different merchantable species are cut down and their rate of growth ascertained by counting the ages at different cross sections. In other words a stem analysis is made of a sufficiently large number of carefully selected trees to furnish accurate evidence as to the rate of growth and development of different species under different conditions and in different situations.

At the same time existing roads and trails are surveyed and mapped, studies are made of reproduction, danger from fire, galling, and insect attack, and of the best means of preventing these injuries. Methods and transportation facilities are carefully investigated and often at the suggestion of the

no attention is paid to waste in logging in at the mill with suggestions as to the means of reducing it.

The result of the investigations is embodied in a working plan which is accompanied by a map showing the distribution and stand of timber, the general physical features affecting logging. In some instances, notably in Maine and Maine, have had these reports prepared as relief models of towns, showing the character of their operations. The working plan itself shows the amount, character and accessibility of the timber in the tract in question. The operation determines the timber product obtainable from the tract. The latter part contains tables showing the rate of growth in volume of certain tree yields, showing how much may be cut from a given tract without endangering future supply, as well as telling how soon the lumbermen may come back and what they may expect to count in getting it that time if he were to cut to a certain diameter limit now. There are also outlined in the working plan the cautions to be observed in cutting such as are necessary to procure a reproduction of certain valuable species to prevent waste or windfall or other dangerous influences.

That these working plans are meeting with favor is testified by the number of lumber companies all over the United States who are asking to have them made. An example may be quoted is that of a well known firm, The Great Northern Paper Company, who had a working plan made over 275,000 acres in North Maine. One half of this was done in three and a half months by a force of thirty-two men. The main object was to provide for a supply of spruce reproduction after cutting, and to decrease the amount of balsam. Detailed instructions for lumbering were given and so far as spruce reproduction was concerned they were a success. I worked three weeks last Christmas on land lumbered according to these instructions and found nearly enough spruce reproduction already.

Another investigation of importance to lumbermen particularly is that known as commercial tree studies. These constitute investigations of adaptability of important trees to management for commercial purposes and quick determination of the timber production in different diameters, the rate of growth in different diameters, present supply, and management necessary to procure future reproduction, uses of timber at present, its possible uses in future markets. In many cases the foresters reach the same conclusion as the lumbermen, in a few cases they do not, and then the lumbermen are obliged to adapt the new ideas, if they mean to stay.

NEW BRUNSWICK FORESTRY CONVENTION

19

The study of the uses of the timber has been one which is interesting the trade generally. In connection with various mechanical and chemical laboratories, mills, factories, and railroads experiments are carried on to test the strength, durability, and other important qualities of wood not usually considered by merchants and to determine what products can be used to advantage in various commercial and domestic uses. In connection with the study of different uses of the wood, the question arises under what conditions is the best proportion of the products of the forest to be used. Other products which have been investigated where the value of one had been previously used.

Manufacturing and telephone companies have taken up the question of timber preservatives extensively, and as a result of the study of my products there are a great number of laboratories established, and being established, in the different states in the hardwood belt.

In Boston a wood pulp laboratory has been established which is now making paper from almost everything, and doubtless as prices continue to soar many other schemes to utilize hitherto unvalued species will be developed, and the lumberman will be enabled to cut more timber off his land and to secure larger profits and make use of waste materials from his mill.

It is in the organization and management of forest lands that forestry most intimately touches national life in general and lumbering in particular. To insure that forests will be maintained, where necessary, as a protection and that a sufficient supply of timber will always be present to support home-builders and a flourishing lumber industry it is necessary to protect it from fire and to dispose of it as soon as it is mature or as soon as it can be spared.

Up to the present date fire protection has been the chief idea of the United States, and as fire protection must be one of the first steps for forestry preservation in New Brunswick, it may be interesting to note the methods.

Each reserve is managed as a separate unit from the central office at Washington, and the forestry officials, supervisors, rangers, and guards, though given wide authority, with corresponding responsibility are appointed by and directed by a code of instructions formulated by the head office. All officials, excepting the forest guards, are civil service employees,

and are protected from discharge upon any cause except gross neglect or inefficiency by the provisions of the Civil Service Act. They are paid from \$720 per year, to \$2500 in the case of the supervisors.

The supervisor is responsible for the patrol and protection of his reserve, and he is expected to devise means best adapted to protect it. Whenever circumstances demand it he is authorized to hire additional forces, purchase materials and supplies, and to provide for the transportation of such, incurring expenditure up to \$400 for the extinction of fire. If a greater sum is needed the supervisor telegraphs to the head office for authority.

The rangers are generally one level up permanently, though the force may be decreased during the non-dangerous season. They are required to be men of woods experience, to live on the reserves, to furnish their own horses, or in country where necessary their own boats, and supply a camp equipment. The rangers report monthly to supervisors concerning all fires occurring in their districts. These reports cover the location of the fire, damage done, probable cause, and all particulars of discovery and methods, time, and means of extinction. At the end of the year the supervisor is present in annual fire report for each district to the head office.

Since this system of fire protection has been adopted, the area of land under protection has been doubled, yet the area annually burned over has been reduced by one-half. Only 16 acres in each 10,000 were burned over in 1905, and the total cost of extra labor and supplies for fighting fires on 92,000,000 acres was only \$12,500.

The total amount of timber destroyed by fire on an area of 92,000,000 acres under such system of protection was only 152,000,000 board feet, while on a total area of 42,000,000 acres of Forest Land New Brunswick in 1903 lost 184,000,000 board feet; or on the United States reserve lands 165,000,000 feet were burned for each 100 acres. On New Brunswick forest lands 1527 board feet were burned for each 100 acres. This extra 100 feet would have paid for quite a bit of fire protection.

The system followed is that of watching for fire instead of waiting for it. A constant lookout is kept during the dangerous seasons at the commanding points, and the reserves are patrolled as often as possible. Roads, trails and fire lines are built on reserves, or wherever they are most effective in checking fire, and the reserves are so arranged as to be accessible

Telephone lines are constructed to facilitate the summoning of assistance. In the Maine spruce woods look-out stations have been established on high hills where they command a view over a township or more, and during the dry season men are kept constantly on the watch in each tower. All are connected by telephone and each is equipped with a range finder so that when fire is discovered, by communicating with one another they are able to locate it definitely and direct as well as summon help. The equipment is supplied by the lumbermen and the wages of the watchmen are paid by the State. During the first year of their service they proved so satisfactory that they are being increased this year.

The same force in the reserve which constitutes fire protection is also responsible for safety from trespass.

The vital point of the whole scheme—the one about which the lumbermen were the most sceptical—was the successful and businesslike disposal of the timber by the Government. Here was where in a real sense success and failure were prophesied. But, possibly spurred on by these considerations, an organization was developed which is simple, satisfactory to the consumers, and efficient for the nation.

The supervisor acts as business manager of the reserve and in that position is his adviser a technical assistant, who is a trained forester, and also is responsible for the study of reserve conditions and the preparing of working plans.

All timber or forest reserves which can be cut safely and for which there is a net real need are for sale and always open to applications for purchase. All good timber is for sale and sometimes given away. Good timber is for sale except where its removal reduces the timber supply below a point of safety or seriously affects streams.

The rules governing the purchase of timber are simple and effective. They are framed so as to give the resident farmer, struggling mill owner, and wealthy would-be monopolist, all equal chances, except that small applications are considered first. Applications are made to the local officer in charge, who has power to execute on the ground sales up to a stumpage value of \$20.00. If the sale is larger the application is immediately forwarded to the head office which advertises the sale. All bids are made by sealed tender sent to the forest service, and the price absolutely fixed by the highest bid. If the original applicant should wish to begin cutting immediately he may

do so upon paying in advance a price fixed by the forest service, and engaging to pay the amount set by the highest bid. In this way delay is avoided, and a company may begin to cut in a few days after making the application. Speculation is prevented by a provision requiring that timber be removed within a certain time, and when a contract extends over a number of years a proportionate amount of timber must be removed each year. No contract made for a longer period than five years.

All timber is cut according to regulations laid down by the forest service after study is made on the spot by technical assistants, and it is possible these regulations soon may not cause any hesitation on the part of the lumbermen. Since this system of timber sales has been introduced the number of licenses granted and quantity of timber cut has each greatly increased, and the forest has been left in much better condition by its removal.

A well-known case is that of the Minnesota reserve, where five per cent of the pine were left standing for seed trees, and the brush was all burned. This measure was introduced in the face of much opposition, but has since proved terrible, and has exploded the fallacy that pine will not grow on the same ground twice. In this instance, as in all others, the object has been to remove the mature timber and to accomplish reforestation by natural means. The brush from 125,000,000 feet of red and white pine was burned at a cost running from 15 cents to 25 cents per thousand feet. This expense approximates that incurred by the employment of an extra swamper for each cutting crew, and the piling facilitates operations by permitting the teams to move around more easily. The ground covered by the fire in burning the brush in no case exceeded 2 to 7 per cent of the total area. It is expected from the results of this experiment that as soon as the habits of different species are fully known and understood such scheme may be introduced in lumbering so that a new stand of any desired species may be secured by natural reproduction, and that actual tree planting will play a very small part in the business of forestry. Where necessary, however, on reserves which either have not enough timber or which are covered with undesirable species nurseries are being established under the care of the local rangers and planting is being gradually done under the direction of the supervisors.

The relation of the lumbermen to the reserve then, is this—they buy it at prices practically set by themselves, they cut it as usual, except that all trees to be cut are marked for cutting, and that they leave a few trees for

seed-trees which they do not pay for, and that they are assisted in their scaling, and in that supervision of cutting crews which is necessary to prevent waste. On the other hand, they are furnished with maps showing the lay of the land and the situation. Also they know that they may depend upon a fixed supply of timber in any locality, and that fire protection is assured. In this way forestry is a guarantee of continued lumbering.

That such a sensible and business-like management of the reserves is a good investment is proven by the fact that though the staff of the administration is increasing and expenses are increasing the forest service is asking for a smaller appropriation this year than last, and has made a definite promise that in five years, in spite of many new projects requiring increased expenditure, it will be self-supporting, and will have ambitions to become revenue-producing.

I have only given a skeleton of the methods at present practised on this continent under the name of forestry, with a very faint conception of the results to be obtained, and with the hope that upon her magnificent, unadorned forest areas New Brunswick, profiting by the example which she has so near at hand, will build up a forestry policy which will be so statesman-like and so successful as to excite the emulation of the other Canadian Provinces and of the Government of the Dominion itself.

The meeting was then declared open for discussion, in which the following took part:

Mr. Hazen, M. P. P., Dr. Jones, Mr. Stewart, Mr. McMillan, Hon. Mr. Tweedie.

MR. HAZEN.—The Chancellor of the University gave us a very interesting address this afternoon on Education and Forestry, and we were very much obliged to him for the great trouble he went to in preparing and submitting in such detail the courses of study necessary in a course of study of that sort. I would like to ask him if he pursued his inquiry far enough to know whether in a university like Yale they are taken advantage of by many students, and if among the lumbermen of the country there is much demand for the services of those students after they graduate from the institution, having taken the course which he has suggested.

CHANCELLOR JONES.—I did not count up the number of students

on the Yale catalogue, but I think there must be 65 or 70, and judging from the announcement contained in the catalogue there is an exceedingly great demand for trained men along this line, and I think the same is true in connection with the Billmore Forestry School, which is largely a practical one. Of course they will not guarantee positions, but they say there is no trouble whatever for any young man who has taken their course of study to obtain an exceedingly lucrative situation.

J. FRASER GREGORY. In the Ottawa Valley the lumbermen are seeking these students continuously. Mr. Edwards told me he had several of them in his employ. They are in great demand, and they cannot get enough of them.

MR. ELLIOT STEWART. With reference to that I would say that in the Forestry service which I have charge of I have had to go out of the country in order to get trained foresters. I do not mean that I have been engaging other than British subjects, but they have been trained outside of Canada. My first assistant was a graduate of Billmore, but a British subject and very anxious to get into our service. Since that I have had one from Cornell and two from Yale, and Mr. McMillan, who has just read a paper to you, has been with us in the Northwest for three years, when he has not been at College.

As for the lumbermen employing trained students I am not aware that any of the Ottawa lumbermen have in their employ graduates of these institutions; but I know the interest Mr. Edwards and other lumbermen have taken in the matter, and I have no doubt that men familiar with the lumber industry in this country, and with a technical knowledge, can get employment. The difficulty is to get men who are familiar with our woods. In getting fire guardians in the West I have found it better to get men familiar with the district, even without a technical training, than to take a technical man from outside who was not familiar with it. That means we will have to train men who are familiar with our own districts in order to be successful in that line.

In connection with the remarks made by the Chancellor I was very much struck with the practical manner that he is going about it, in connection with the lectures that are already delivered at the university and which take up much of the course required by the schools of Forestry. There was one thing I was going to speak of, and it was remarked by someone here,

and that is a short course for lumbermen — a short course to give the men in the woods — scaler — and others — some knowledge of the tree itself. I think it would be a capital idea. Not necessarily that the person going there should pursue the full course, but should have means of acquiring a certain amount of practical knowledge of the tree, its uses, etc.

The last speaker has referred to the work done by the Forestry Service at Washington, and I have no disposition to criticize it at all. But that service is crippled. They have not the chance to do the work — have in Canada, as they are confined to the forest reserves, and they have had to go to the State of Washington which have destroyed billions upon billions of timber outside of the reserves. In British Columbia we have a railway belt owned by the Dominion Government, extending about twenty miles each side of the C. P. R. for a distance of 500 miles. This was a contribution from the British Columbia Government to the Dominion Government towards the building of the C. P. R. We have divided this belt into tracts or belts and appointed a head fire ranger, with eight or ten rangers under him, and for the five or six years this has been going on, have lost scarcely any timber. I just mention this to show the advantage of the forestry service. Outside of this railway belt is Provincial territory, where they do not have this service and they have lost an immense amount of timber, so much so that the people of British Columbia are — waiting for a regular service to that within the railway belt.

MR. H. B. McMILLAN — In reply to the question asked about the Yale Forestry School I might say that about 40 students there, and the lumbermen have become so much interested in it and so much impressed with what it can do for the lumber industry, that they have sought to endow a chair in lumbering, and every year are demanding more of the graduates; but they do not place a man directly in a high position who comes from some other part of the country and doesn't know anything of the local conditions. They usually require him to go into the camps and work as chopper or swamper, or in some such capacity, until he is able to take charge of the camp as any lumber boss, and then he gets a better position and becomes a valuable man.

MR. TWEEDIE — I may say that within a short time several large employers of labor throughout the Province, principally lumbermen, have spoken and written to me with regard to the scarcity of labor, and asked me to help you of the Government in regard to immigration, and to delegation



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written upon me the other day with regard to obtaining a number of immigrants, as men were very scarce. I informed them that I would communicate with the Brigadier of the Salvation Army at Toronto and ask him to send one of his officers down here during the Convention, so that any person might have an opportunity of discussing the question with him. Adjutant Jennings has been sent down, and is with us, and perhaps he might now give us some information as to the class of people they bring and how many they will likely bring to this Province this year.

Adjutant Jennings of the Salvation Army Immigration Department was then called upon and addressed the Convention as follows:

ADJUTANT JENNINGS

It gives me much pleasure to be here this afternoon on behalf of the Salvation Army Immigration Department, and I shall be pleased to give all the information in my power. The men we bring from the old country would not be accustomed to the lumbering business at all, and could only be employed in that business as unskilled labor.

During the last two years our immigration department has brought to this country something over 20,000 people: and they have been selected, not, as many people seem to think, from the waistrrels or the unemployed of the Old Country, but from the honest, able-bodied, industrious working class. As an example of this I might say that last year, when the first chartered ship of the Salvation Army Immigration Department landed at Halifax the authorities there in charge of the exchange of money said they exchanged more money from that boat than they had from any other boat of immigrants that ever came to the country. This goes to show that the class of people we bring is a little above the average run of immigrants. We do our best in the selection of these immigrants, and so successful have we been in that selection, that people on the other side are complaining that we are bringing the cream of the working class, the home and nurse of the nation.

We expect during the summer season of this year to bring to this country some twenty-five or thirty thousand people, according to the demand. We have chartered eight steamships to bring these people over. The first chartered ship will leave Liverpool the 28th of this month, and will land in Hal-

fix about the 10th of March, and we will have a chartered ship every two weeks after that. Besides that, we have made reservations on the C. P. R. lines running into St. John and the Allan Line from Glasgow to Halifax, and also the Dominion line running to Halifax. We have reserved space on the boats coming to St. John and Halifax during the season for something over 10,000 people. These will pass through the Maritime Provinces and will be in my hands to place, so far as the distribution of them is concerned, and as many will be placed in the Maritime Provinces as are required. We endeavor in dealing with these people to consider the highest good of the individual we are dealing with, as well as the country they are coming from and the country they are going to. Our policy is careful selection on the other side, wise handling of the people while they are in our hands, and the suitable placing of them in this country.

HON. MR. TWEEDIE — You don't deal with the criminal classes at all?

ADJUTANT JENNINGS — No; we do not bring the criminal or worthless classes. There is a class of people that is really worse than the criminal class, and that is the worthless class, the people who are not fond of work, and we endeavor to sift these out and bring only the class of people suitable to this country. And although there are a large number of people deported every year, yet out of the 20,000 already brought to this country by the Salvation Army, less than twenty of that number have been deported as unsuitable.

One of the difficulties we have to deal with in the Maritime Provinces is that the season is so short here, because as soon as navigation opens in the St. Lawrence the vessels all go to Montreal, and we find it very difficult to get these people to come back here. They seem to think it is a going back, and they prefer to go on to Ontario and the West. Last year we did succeed in getting a few to come down from Quebec; but they were influenced against their will and did not give very good satisfaction. They did not settle down, and a number of them, after all, went to Ontario and some of them to the West.

I might say we do not handle boys and girls. There are institutions which do handle boys and girls; but so far the Army has not done so. We do handle domestics; but we can only supply about one for every ten applications we receive. We bring a good class of domestics—above the ordinary

but I am given to understand by our people on the other side that it is a very difficult matter to get girls of the class we have been in the habit of bringing, for the reason that they can get almost as much wages there as they can in this country; and I find that the wages in Ontario, especially in the larger cities, are very much higher than in the Maritime Provinces.

HON. MR. TWEEDIE—What would the wages be in Toronto?

ADJUTANT JENNINGS—The girls that we bring from the old country can get in Toronto from \$12 to \$15 and \$18 a month, and this is a larger wage than a great many in the Maritime Provinces care to pay.

If there are any questions anyone would like to ask in regard to our immigration work I will be pleased to answer them.

MR. JAMES REVERIDGE—I may say, as one of the employers of labor in the Province, that I have employed Salvation Army immigrants, and I want more of them. They are well behaved, and although they are not what we would call skilled laborers, yet they are very excellent men. I am told, however, that it is very difficult to get them to come down East here, and I would like to ask Mr. Jennings if it is simply a question of wages.

ADJUTANT JENNINGS—No, I think not. It is pretty hard to tell just what their reasons are. They cannot give a definite reason themselves, only the fact that they have gone up to Quebec, and they say it is going back towards home again. They said they do not care to go back, they want to go ahead. That is about all we can get from them.

HON. MR. TWEEDIE—Of course, the West is more advertised, and naturally they hear more of it.

ADJUTANT JENNINGS—That may have something to do with it; but their chief excuse is that they don't want to go back. I have been in the Maritime Provinces since last July, and previous to that I had been in Ontario in connection with immigration for about a year, and for twenty years previous to that I lived in the Maritime Provinces, and from my knowledge I am of the opinion that the wages are just as good in the Maritime Provinces, comparatively speaking, for unskilled labor, as in any other part of the Dominion.

A DEBATEE—What wages would an experienced farmer command?

ADJUTANT JENNINGS—What we call an experienced man is one who has worked at farming in the old country all his life, and of course some are better than others. They work for from \$18 to \$25 a month and board.

MR. JAMES BEVERIDGE—Have you any figures showing the rate of wages for ordinary unskilled labor in the factories in the West as compared with the East?

ADJUTANT JENNINGS—No, I haven't any figures; but last year I handled some hundreds of applications in the Eastern part of Ontario, between Toronto and Montreal, and judging from that I would say the wages are just as good in the Maritime Provinces, and as far as my knowledge goes there are just as good opportunities for immigrants in the Maritime Province as in Ontario. The only difference is that the season is later here and the agricultural labor is not needed quite so early, so that before the farmers get thoroughly awakened to the fact that they need a number of men they have gone West. If the farmers would apply earlier we could supply any number while they are passing through our hands, and we would be only too glad to give Maritime Province people the preference; in fact I have the permission of Brigadier Howell to take the people as they pass through and pick out those most suitable for the Maritime Provinces.

A DELEGATE—What is the nature of the contract between the Salvation Army and the parties who come out here? Have you any definite contract with them?

ADJUTANT JENNINGS—No, we have no definite contract with them. We guarantee them work in Canada, but we only guarantee their work on the land. As to loans, there are about sixty per cent. of the people who come who pay their own way and only come through the Army Agency to get the advantage of our counsel and advice and be sure of getting work when they land here. About forty per cent. are not in a position to pay the whole of their passage. They pay perhaps a half or two-thirds, and we make them a loan of the balance, and in that case they sign an agreement showing the total amount they have received, to be paid back in small monthly instalments after they have been a certain number of months working in the country. The payments do not begin as soon as they land, for about three months later they are supposed to begin to pay the money back. That is the only contract we have with them.

MR. JAMES BEVERIDGE—If we required say twenty-five men would we have to make the contact with you or arrange with them when they arrived?

ADJUTANT JENNINGS—You would make the contact with them through us. We have a proper application form, and if you ask us to supply you with say 25 men, for a certain purpose, and agree to pay them a certain wage, we act as your agents at the port of landing, and we say to them: Here is a man willing to employ you and pay you so much if you come up to the standard on that application. It is then for the immigrants to say whether they will accept your offer. If they do we send them to you with a card of introduction.

MR. CONNOLL—If they do not wish to take any of the positions you have for them are they free to go where they please?

ADJUTANT JENNINGS—Yes, if they don't want to accept our situations they can go where they please.

MR. JAMES BEVERIDGE—Do you think the average laborer coming out from England would consider \$1.25 to \$1.75 per day of ten hours attractive here in the East?

ADJUTANT JENNINGS—Yes, I should think so. We always advise employers of labor to take married men, if they have proper arrangements for housing them, for the reason that married men are more likely to stay in a place when they once get settled, and in a great many cases they have families growing up, who will in a few years furnish the labor needed in the Province.

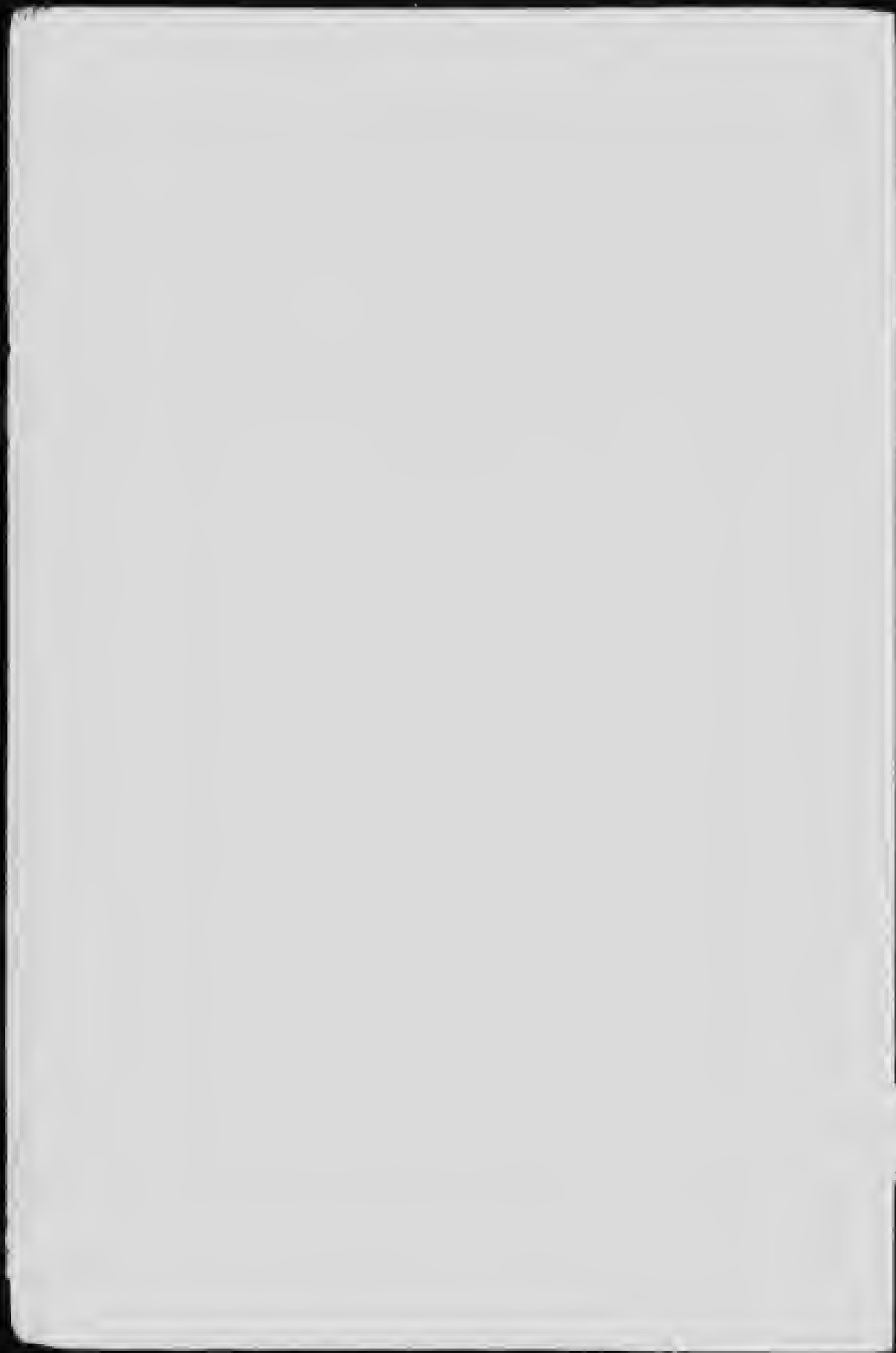
HON. MR. BURCHILL—Did I understand you correctly to say that the importations of the Salvation Army were made almost entirely from men accustomed to working the soil, or do they include men working at other occupations?

ADJUTANT JENNINGS—The class of people we get from the other side perform all kinds of labor; but we do not guarantee any but workers of the soil. For instance, we have a number of mechanics coming; but we do not advertise on the other side that we can find employment for all skilled labor.

HON. MR. BURCHILL—I do not mean skilled labor. I mean



SCOTT'S MILLS FREDERICTON N. B.



ordinary workmen such as Mr. Beveridge would employ cutting wood and lumbering and that sort of thing.

ADJUTANT JENNINGS —I do not think the average immigrant is much used to cutting wood or lumbering; but a great many of them are used to handling lumber as it is transferred from the steamer, and such like. Last year sixty per cent. came from the town and villages. The larger portion of them had been used to ordinary laboring work. About forty per cent. came from the agricultural districts; but about twenty-five per cent. of the sixty per cent. were born and brought up in the country, but had drifted to the city and worked there a number of years — anywhere from two to ten years in the city. The majority of the people we bring are used to heavy hard labor.

HON. A. R. McCLELLAN —What is the proportion of married men as compared with single men, that you have brought?

ADJUTANT JENNINGS —I am not quite sure of the number we have brought; but year before last the applications we got from married men was only two per cent., while last year they had risen to twenty-five per cent.; so it is evident we brought at least twenty-five per cent. of married men last year. There are a great many married men who are not in a position to bring their families with them; but they send for them when they are able and we bring them out.

The Convention then adjourned until evening.

THURSDAY EVENING SESSION

The Convention was called to order by the Preider, at 8:20 p. m. when Dr. Bailey of the University of New Brunswick read a paper by Prof. Penhallow, of McGill University on the Pulp Industry of Canada, which paper was illustrated by lantern pictures.

D. P. PENHALLOW.

THE WOOD PULP INDUSTRY OF CANADA.

LIST OF SLIDES.

1. Papyrus (*Cyperus papyrus*).

- 2 *Cyperus alternifolius*.
- 3 Pith of *Aralia papyrifera* (Chinese rice paper).
- 4 Chinese rice paper (magnified).
- 5 Tappi cloth from the New Hebrides (*Broussonetia papyrifera*).
- 6 Fibre from Japanese paper (*Broussonetia papyrifera*).
- 7 Wasp's nest. Exterior view.
- 8 Wasp's nest. Interior view.
- 9 Paper from nest of wasp (*Vespa maculata*) magnified.
- 10 Paper from nest of wasp. Magnified and separated fibres.
- 11 Pulp-wood Statistics.
- 12 Chicoutimi Mills.
- 13 Sault Ste. Marie Mills.
- 14 General View of the Mills at Grand Mere.
- 15 The Profile, Grand Mere.
- 16 Map showing the distribution of Spruce Forests in Canada.
- 17 Spruce Forest.
- 18 Spruce Forest.
- 19 Interior of Spruce Forest.
- 20 Logging.
- 21 A log drive ready for the Spring treshets.
- 22 A log boom.
- 23 Pulp-wood logs piled at the Mill.
- 24 The Barking Room.
- 25 *Picea nigra*. Longitudinal section.
- 26 *Picea nigra*. Transverse section showing resin canals.
- 27 *Picea nigra*. Transverse section without resin canals.
- 28 *Picea nigra*. Transverse section showing the three layers of the cell-wall.
- 29 The Grinding Room.
- 30 Press Room for Mechanical Pulp.
- 31 Mechanical Pulp Fibre, magnified.
- 32 Mechanical Pulp Fibre, magnified.
- 33 Chips for Sulphite.
- 34 Chips for Sulphite after reduction.
- 35 The Digesters.
- 36 The Sulphite Tower.
- 37 The Sulphite Retorts.
- 38 Sulphite Fibre, magnified.
- 39 Manila paper, magnified.

- 40 The Beaters
- 41 The Paper Press. Wet end.
- 42 The Paper Press. Front view.
- 43 A High Stump.
- 44 Wasted Tree tops.
- 45 Tree cut but left standing.
- 46 Skidways left in the woods.
- 47 Road bed made of spruce trees.
- 48 Trees cut for the Crush.
- 49 Table of Rate of Growth.
- 50 Yield Table.
- 51 Reading Room, Booth & Gorham's Camp.
- 52 Wallace & McCormack's Reading Camp.
- 53 Hale & Bell's Camp.
- 54 Ontario Lumber Co.'s Reading Room.
- 55 Portable Reading Camp.
- 56 The Laurentide Mills.

THE WOOD PULP INDUSTRY OF CANADA

The history of paper-making carries us back about six thousand years (3966 B. C.) to the time of the ancient Egyptians, whose use of a material which required no special fabrication may be held to constitute the primitive form of an industry which has now come to rank among the foremost in the world, and the products of which not only represent a great diversity of raw materials and finished fabrics, but which also call for great skill, the utilization of large capital, and the employment of costly and intricate machinery for their development. The contrast between the primitive papyrus paper obtained by the expenditure of comparatively little labor, and the highly-finished product of today as resulting from a series of laborious processes, probably affords one of the most conspicuous examples of industrial development which the world can show.

PAPYRUS (CYPERUS PAPYRUS)

Papyrus was widely employed throughout India and Egypt as a paper until about 400 B. C., when its use was displaced by parchment. Since then the

special cultivation of the plant has been discontinued, and its range has gradually become more restricted until it is now found only within narrow areas. The plant is a native of Egypt and other portions of the Mediterranean region, to which it is now almost wholly confined. It nevertheless has numerous representatives in other parts of the world, and the general reed-like habit, with the large terminal, umbrella-like expanse of branches, is well represented in its familiar relative from Florida, the *Cyperus alternifolius*, a plant now somewhat extensively used for table decorations and commonly spoken of as the "Umbrella Plant."

In the manufacture of paper from the papyrus, the most primitive methods were employed. The triangular stem was first of all divested of its hard, outer rind, when the pith so obtained was cut into long and narrow strips. These were laid side by side and carefully cemented together under moist pressure by the application of a second series of strips crossing the first at right angles. An extension of this method permitted the formation of sheets of any desirable size, but it may be observed, that inasmuch as the product was obtained by a simple process of slicing, it could not be regarded as paper in the modern acceptation of that term, i. e., a fabricated material the component elements of which have been separated from their former relations in the original material and recombined by a process of felting. It was, in fact, a product which represented the original material transformed only with respect to its external features by the aid of the most simple of mechanical processes.

For an unknown period of time, the Chinese have employed a primitive paper, which is closely similar to papyrus. Though differing with respect to the plant from which it is derived, it is substantially the same with respect to the part of the plant from which it is taken, with respect to its detailed structure, and also with respect to its mode of preparation. We are all more or less familiar with the so-called rice paper of the Chinese. It is employed as a favorite material upon which to draw brightly-colored flowers and costumed figures, because of the peculiarly velvet-like surface which it develops when so employed.

PITH OF *ARALIA PAPIRIFERA*

This so-called paper is derived from the very large pith of a kind of aralia (*Aralia papyrifera*) indigenous to the Island of Formosa and now extensively cultivated in China. The voluminous pith is first removed from

NEW BRUNSWICK FORESTRY CONVENTION

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the surrounding wood and cut into convenient lengths of a few inches, and then, with a sharp and thin-bladed knife, it is opened out into sheets a few inches square. Under most pressure these then retain a permanent form but a careful examination will always disclose the unequal thicknesses due to the action of the knife. From the account thus presented the parallelism between papyrus and rice paper becomes very manifest.

PHOTOGRAPH OF RICE PAPER

Mr. Joseph Hooker was the first to dispel the illusion that this material is derived from rice when he showed that it exhibits all the characteristic features of the unaltered structure of the original pith from which it was taken. A photograph of this paper, as seen under the microscope, will not only enable us to appreciate the extent to which it differs from ordinary paper but it will at the same time show what is substantially the interior structure of papyrus.

TAPPA CLOTH

Among the islands of the Pacific, interesting forms of primitive paper or cloth may also be found, as illustrated in the tappa cloth of the Sandwich Islanders, which they use for the manufacture of clothing. The material employed is the very fibrous bark of the paper mulberry (*Broussonetia papyrifera*), which we shall presently find to acquire additional interest from its use elsewhere. In the process of manufacture, the bark is simply beaten out until the original fibres are brought in new relations and made to form a rough felt.

Among the Japanese, as among the Chinese, various materials have been employed for centuries in the manufacture of paper after methods which are identical in principle with those so well known among ourselves, and thus cotton and other easily-obtained fibres have played an important part in their paper industry. Certain kinds of Japanese paper have long enjoyed a special reputation, both at home and abroad, for their fine texture, exceeding lightness and great strength, as well as for the possession of a peculiar surface which makes them especially adapted to certain classes of artistic work. So fully is the superior value of this paper recognised, that our own paper makers now endeavor to imitate it. Its origin is in the fibre derived from the inner bark of the paper mulberry, which is macerated until the individual elements readily separate under the

mechanical action of a wooden hammer or maul. After suitable washings and bleachings, the cleansed fibre is gathered by a series of dippings, into a hand tray of the dimensions of the sheet required. The tray is rocked gently, and as the water finds its way through the meshes of the bamboo sieve at the bottom, the fibre is deposited in an evenly-felted layer, which dries into a sheet of paper without special pressure.

FIBRE OF JAPANESE PAPER

A microscopic analysis of such paper shows it to be composed of fibres, the original length of which is preserved, and in the interlacing of such enormously long filaments, we obtain the explanation of the peculiar toughness for which these papers are remarkable.

Among Europeans, numerous materials are employed in the manufacture of paper with a corresponding diversity in the character and quality of the product, which may be taken to represent adaptations to particular requirements of cost and the purposes to be served. It is stated that more than 400 different kinds of material are employed in the manufacture of paper, and the final product finds its way into an almost infinite variety of industries, from the manufacture of lumber and car wheels, to the production of bank notes and its employment by the skillful artist as a suitable base for the highly-finished products of his brush. One of the most modern phases in the development of the paper industry is to be found in the extensive utilization of the fibres of wood, as exhibited in the pulp industry of today.

The application of the fibres of wood to the manufacture of paper is commonly attributed to Reamer in 1719, who observed wasps constructing their nests of fibres gathered from wood, which they wove into a paper, and inasmuch as man has found it profitable to follow the general methods adopted by these humble forms of life, we may well digress for a few moments to study their ways.

The most familiar paper-making wasp is the common black-and-white wasp (*Vespa maculata*), ordinarily known as "hornet." Any day in summer, when the insect is at work, one may observe it gathering material from the weathered surfaces of posts and fence rails. Alighting upon a cedar post with its head upward, the insect immediately commences to gather up the partially-separated fibres in its jaws, all the time working downward. In the space of about one minute it will have worked over a

distance of about one inch, stripping the fibres clean for a width of about one-eighth of an inch, thus leaving a well-defined mark which may be traced on the surface of the post for several weeks.

EXTERIOR VIEW OF NEST

Flying to the nest with the material thus gathered, the insect then proceeds to incorporate it in the general fabric in such a way as to produce a strong felt which is capable of withstanding the stress of storm, and of affording an ample protection to the brood within. The general result is

INTERIOR OF WASP'S NEST

the construction of the nest upwards of a foot or more in diameter, with the apex pointing downward, the walls of which are multi-seriate, and thereby present a succession of air cushions which secure the necessary protection against changes of temperature.

WASP PAPER. NATURAL.

Under the microscope the paper is seen to be made up of loosely-felted fibres, which, in the majority of cases, are completely separated from one another, though, in a few cases, they may be found united in small groups. In all about six such fibres make up the total thickness of the paper, which varies somewhat, but on the average amounts to the 1-25 of a millimetre.

WASP'S PAPER. SEPARATED FIBRES

If a portion of such paper is now macerated and teased out in water, the individual fibres may be readily separated. It will then become apparent that, in the majority of cases, they represent the completely-separated fibres of the original wood, while here and there may be seen a few cells still united. Such an analysis also discloses the interesting fact that while the color of the paper is fundamentally due to weathering of the fibre, it is also due, in large part, to the presence of numerous filaments and spores of dark brown fungi, which give rise to blackish spots and streaks.

Here then, we find a paper constructed upon the identical principles which underlie our modern processes, but produced by the most primitive of all paper makers whose origin antedates that of even the ancient Egyptians, and it thus becomes evident that the use of wood pulp in the manufacture of

paper is a fact of great antiquity, though but recently discovered and utilized by man.

It is but a comparatively short time since all paper was made by the laborious hand process yet to be seen in full operation in Japan where the low price of labor and the comparatively small demand for such produce has, until recently, made this method sufficient for all requirements. Under rapidly changing conditions, however, the hand method has become inadequate, and the recent introduction of machinery has wrought a revolution affording a modern example of rapid development in an industry which, in our own history, has been brought about only through the lapse of long periods of time and through great experience. With us hand made papers have become largely a matter of history, though they are yet produced in special cases where fine quality is demanded. The growth of the modern newspaper, the extensive and increasing demand for good literature which shall be within the reach of those of limited means, and the numerous directions in which paper may be profitably employed in the manufacture of articles of great utility but low cost, have combined to force the costly hand made paper into a minor position, and to create a demand for an article which may be easily, quickly and cheaply produced. In the first instance, the introduction of machinery was the earliest attempt to meet these requirements; but the constantly increasing demand soon led to attention being directed to our forests as the possible source of a material which would be at once cheap and permit the production of a paper of ample quality to meet all the requirements of temporary use. At the same time it would be possible in this way, to turn to account in a profitable manner, vast quantities of timber which would be of little or no value for other purposes. There has thus arisen one of the greatest industries of the world. In 1897 the total value of wood pulp exported from European countries amounted to \$16,468,089, while in 1900 it had risen to \$18,000,000 or an increase of 8.7 .

In the United States the manufacture of wood pulp was first introduced in 1854, but the process upon which the present industry is based was not introduced until 1867. It was not until 1870, however, that the manufacture first appeared in the Census returns, at which time only eight factories were enumerated. In 1880 there were fifty mills in operation with a capitalization of \$2,256,946. By 1890 there were 82 mills in operation, representing a capital value of \$4,627,796, while the census of 1900 has shown 763 mills with a total value of \$167,597,733. The total value of the products of these

mills is stated at \$127,286,162. To the student of economies it will doubtless prove of interest to ascertain the movements of the enormous capital thus employed, and from information kindly supplied by the United States Census Bureau, it appears that the disbursements were as follows:—

Salaries of office staff, etc.,	.....	.....	.....	\$ 4,500,911 00
Wages,	.....	.....	.....	29,746,426 00
Miscellaneous expenses,	.....	.....	.....	19,184,166 00
Materials, supplies, etc.,	.....	.....	.....	79,530,230 00
				\$105,961,679 00

The growth of the pulp industry in Canada has been of much more recent origin, but its development has followed on parallel lines and the economic aspects are essentially the same, whence a study of the more extensive developments in the United States affords an accurate indication of what must follow here on a more limited scale.

TABLE OF STATISTICS

From information kindly supplied by the Dominion Statistician, we learn that there were in operation in Canada in 1900 40 pulp mills, while 19 others were projected. The total capital represented was about \$20,000,000, with an output of 470,700 tons of pulp, of which 300,900 tons were mechanical and 169,800 tons were chemical pulp. For the year 1895 the total export value of Canadian pulp was \$598,874, while in 1900 it had risen to \$1,274,376, or an increase of 113 per cent. In 1900 the total value of pulp and pulp products exported was \$2,718,788, and in 1901 this value had risen to \$3,335,265. It will thus be seen that the industry has been advancing at a rapid rate within the last few years, and the perfection of other large mills such as that suggested for Chicoutimi and also on the Montreal River, as well as the very large mill now in successful operation at Shawinigan Falls, seems to point to a much larger future. On the other hand, the fact that a large number of mills have been idle for several years, and that some of the larger enterprises have failed within the last year or two, has led to an expression of the belief that the industry has reached the limit of development, and that any further extension must result in disastrous consequences. It may, nevertheless, be borne in mind that much of the arrested development thus indicated, is doubtless due to the employment of antiquated machinery and methods which render it impossible for such mills

to compete with the more progressive and modern plants, which are likely to gain a rapid and permanent hold upon the market. In this connection it might

CHECOTIMI PULP MILLS

be well to note that the developments of the last year seem to indicate that there is every evidence of progression. In the United States there is now in process of development what promises to be the most extensive wood pulp mill on this continent, with a reputed capital of \$6,000,000, while as a result of the great industrial development at Sault Ste. Marie, under the direction of Mr. Clergue, it has been stated in authoritative publications that no large contract for wood pulp paper is made in any part of the world without first ascertaining how prices rule at the "Soc."

The characteristic features of the region in which pulp mills are commonly located, are well shown with respect to the Chicoutimi mills, which also offer an excellent example of those of the smaller type. The enormous water power here available, has now stimulated the projection of a mill on an enlarged scale with a daily capacity of 600 tons of wet pulp.

SAULT STE. MARIE PULP MILLS

The extensive industrial plant now in course of development at the Sault Ste. Marie includes a pulp mill with a daily capacity of 140 tons. Since this was written the mills at the "Soc" have come to dominate the market for wood pulp paper as already shown.

LAURENTIDE MILLS, GRAND MERE

The mills at Grand Mere, with a daily capacity of 180 tons of pulp, were established in 1897; they have twice passed through the ordeal of fire, and today, with an equipment which is hardly more than just completed, they may be said to represent the largest, and one of the best examples of the industry in Canada. Here also may be observed some of the latest developments in the application of modern methods with respect to the use of labor saving machinery and economy in administrative details. By the selection of this mill as a type, and a description of the various processes there carried out, it will be possible to present a concise and connected summary of the essential operations of pulp making, with its collateral industries.

The Laurentide Mills are located at Grand Mere on the St. Maurice

River, about twenty-six miles from Three Rivers, just where the brook emerges from the Laurentian Hills, and makes a bold plunge of 45 feet to the upper level of the valley of the St. Lawrence. No more picturesque location could well have been chosen, and the poetry of the surroundings is

THE PROFILE

greatly enhanced by the profile which appears sharply cut upon one of the rocks at the Falls, and gives name to the town. The various buildings of the mill are scattered along the face of the bold bluff, upon which the town rests, and this advantage is taken of every opportunity offered by difference of level and the natural operation of gravitation. Seven miles up the river at Piles is to be found the outpost of the mill. There is located a large general store from which are drawn the various supplies required in the equipment of the lumber camps beyond, the first of which is only about six miles distant.

The first step in the production of pulp as in the manufacture of lumber is taken in the forest where the wood is cut and later hauled or floated to the mill. The special advantage which Canada enjoys in the pulp industry as compared with the United States, is to be found in her extensive and, under proper conditions, practically exhaustless supply of material adapted to the production of the finest pulp. This fact appears prominently in the United States census returns for 1900, which show that Canada exported to that country, spruce wood for the manufacture of pulp to the extent of 349,084 cords valued at \$2,272,495; an amount which represents 28% of their entire consumption. With this important fact before us, we may profitably inquire into the nature and distribution of this great source of national wealth.

A great variety of woods may be turned to account in the manufacture of pulp, but those which yield the best results are soft woods like poplar, basswood, pine, balsam and spruce. In Europe the gradual exhaustion of the supply has brought many countries face to face with a serious problem. In the United States the great value of most of these woods for other purposes and the limited supply available, has forced attention to be directed toward the utilization of woods of relatively little value for constructive purposes, which may be obtained in abundance and which at the same time are capable of yielding a high grade fibre. These considerations have brought spruce into prominence as the one wood most completely fulfilling the necessary conditions. At the same time it has been found that on the

whole, the northern grown wood produces a better fibre than that of more southern latitudes, and these factors, joined to the immense supply of spruce to be found all through Canada, have drawn attention to this country as the future centre of the industry.

The spruce employed in the manufacture of pulp is of two kinds, the black and the white, which are known to botanists as distinct species under the names of *Picea nigra* and *Picea alba* respectively.

MAP SHOWING DISTRIBUTION OF TREES

A glance at the map of Canada upon which have been traced the northern limits of tree distribution, will at once disclose the enormous area covered by our spruce forests. Commencing at the eastern extremity of Labrador, the line which defines the northern limits of the spruce forests passes westward to Ungava Bay and thence southwestward to Hudson's Bay on the western side of which it continues from Cape Churchill northwesterly to near the mouth of the Coppermine River, and finds its greatest northern extension at the mouth of the Mackenzie in latitude 68 deg. N. Dr. Robert Bell, of the Geological Survey, states that the approximate area of our northern forests amounts to 2,590,000 square miles in which the black and white spruces are the prevailing trees. This area he estimates to be capable of producing 16,500,000,000 cords of spruce. A more conservative estimate by the Dominion Statistician based upon data collected in 1894, places the area of our northern forests at 1,400,000 square miles. If one-half of this area is occupied by spruce, it will give approximately about 450,000,000 acres of spruce, which, on the basis of ten tons of ground wood pulp per acre, would give a total of 4,500,000,000 tons of available pulp wood. At the present rate of cutting for home consumption, this means that continuous and complete cutting could not exhaust the supply, especially when it is remembered that the ground cut over during the first fifty or seventy-five years would again yield a similar cut at the end of that period. There is therefore no special danger to apprehend in the destruction of our forests by the pulp industry, more especially when the more intelligent manufacturers, in their own best interests, pursue a wisely conservative policy in lumbering

SIDE HILL SPRUCE FOREST

The spruce forest whether upon the side-hill or upon the plain presents

SPRUCE FOREST ON THE PLAIN

a very characteristic appearance which at once distinguishes it from all other

growths. The tall spire-like trees with their sombre foliage, carry with them a suggestion of the solitude and grandeur which seem inseparable from forest growths in high latitudes and at high elevation.

INTERIOR OF A SPRUCE FOREST

The first process in the manufacture of pulp is that which depends upon the operations of the lumbermen in the depths of the forest, often remote from the confines of civilization. For the purposes of the Laurentide Company, fifteen lumber camps are maintained in addition to those supported by individual contractors. Here the life involves rugged hardships which, while presenting a certain element of novelty to the uninitiated, are quickly livestock of their poetry when brought within the range of actual experience.

The timber limits operated by the Laurentide Company extend over an area of 1800 square miles, embracing the upper reaches of both the St. Maurice and Matawan Rivers. From this great area are taken cedar, pine, and spruce, as they are met with, since it is found to be a matter of economy in lumbering to make a clean cut of all kinds of wood as met with, above certain dimensions, rather than to make a way round a growth of pine for the sake of the spruce which may lie behind. But none of the material thus gathered is wasted, since each kind finds its own separate use. Thus the cedar is converted into shingles and the pine into lumber, while the spruce ultimately emerges as the chief product in the form of pulp. Some conception of the magnitude of the operations involved in cutting over so great an area may be gathered from the statement that in 1900 75,000 cords of wood were removed for pulp, representing an equivalent of 45,000,000 feet of board measure.

HAULING LOGS

As soon as cut, the logs are hauled out on sleds to the

LOGS READY FOR THE SPRING FRESHET

ices whence they may be delivered to the various streams which float them to their destinations, or they may even be piled on the surface of the frozen river in readiness for the spring freshet. As soon as this comes and the rivers are flooded to their highest levels, the drive commences, and down

LOG BOOM

these natural highways the logs are driven and coaxed along by the thous-

ands, now being tossed high in the air by the swirling waters—the toss of the waves, or again held fast in the unyielding embrace of a narrow defile until released by the daring lumbermen who follow closely on, and, too often at the imminent risk of limb and life, seem to vie with each other in their defiance of the forces which they bend to their will. And thus eventually, the logs are gathered into great benches which stretch their corrugated areas for great distances about the region of the mill.

LOG PILE AT THE MILL

Those logs which are not destined for immediate use, but are to be held in reserve for future emergencies, are now landed out and gathered into an immense pile on the shore of the river, and from this store they eventually find their way into the mill as required. From whatever source they may be taken, the logs are drawn into the mill by an endless chain and immediately cut into lengths of twenty-four inches. Thence by a similar

BARKING MACHINES

process they are transferred to the barking room, where every vestige of bark is carefully removed. This is accomplished by firmly pressing the rotating log against a rapidly-revolving plate which carries three blades in its face. As a result the bark is quickly and completely removed. The now decorticated logs are transferred to splitting knives, where they are halved and quartered by the action of a vertical knife, and it is also at this stage of the process that the first selection is made. All logs which show decay, knots, or an undue amount of resin, are carefully culled and sent to the boiler room, where they are used in firing. Not infrequently the splitting process permits a portion of an otherwise useless log to be saved for pulp, and in this way the material is not only carefully economised, but the high quality necessary for the production of high grade pulp is fully maintained. Many of the decorticated logs are now stored for use in an emergency, as when from fire or other cause, a portion of the machinery in the barking room has to be stopped. Provision is thus made for the continuous operation of the mill notwithstanding the disability of a given portion. The logs which are to be immediately converted into pulp, now travel in two directions by endless chain, according to the particular kind of pulp to be produced.

Speaking generally, two kinds of pulp are made, the mechanical and the chemical. The former is the product of grinding processes intended to

separate the individual fibres of the wood by tearing them apart. The basis of the chemical fibre is to be found in the well-known action of certain chemical re-agents which disintegrate the original structure by a process of chemical solution, to such an extent as to permit complete separation of the fibres without destroying them. The action must, therefore, be carefully controlled. Of the chemical pulp, two varieties are recognised according to the particular method employed. In many of the mills of the United States, and in some of the Canadian mills also, soda pulp is manufactured. This depends upon the action of sodium hydrate, which requires to be recovered from the liquor after action upon the wood, in order that it may be used again. With this process we shall not particularly concern ourselves at the present moment. Other mills produce what is known as sulphite pulp. This results from the action of sulphurous acid upon the wood structure, and the low cost of the reagent does not necessitate its recovery, hence the waste acids simply pass off in the wash, the entire process is greatly simplified, and the cost reduced. At the mill which has been selected as our type, only mechanical and sulphite pulps are made.

In order to fully comprehend the reasons for the two methods of manufacture thus briefly indicated, it will be necessary to digress slightly and make a brief study of the wood from which pulp is made. It has already been pointed out that pulp may be made from quite a number of kinds of wood, but in Canada practically only one kind is employed. If we watch the logs as they pass from the yard to the saw mill, it will be seen that the bulk of them represent spruce, while occasionally a balsam log appears, and accidentally also, hemlock may find its way into the mill. The latter is never introduced by design and its presence is at once detected in the various processes through which it must pass. On economic grounds, balsam is used to a certain extent in the manufacture of pulp designed for local consumption at the mill, but the presence of a large amount of resin makes it an undesirable material for pulp, and it is carefully excluded from all pulp designed for the market. It thus appears that spruce is the only wood used for merchantable pulp. Two species of spruce flourish in Canada, and serve as the source of pulp wood. They are known as the white spruce (*Picea alba*) and the black spruce (*Picea nigra*). Structurally they differ but little from one another, but speaking generally the cells of the black spruce have thicker walls than the white, and this is probably the basis of the preference which is given to the former as we shall see more particularly, presently. It is probably for a similar reason that the compact and tough wood from the northern districts of the Saguenay is preferred to that which comes from

more southern regions. By an extension of this analysis, we also reach an explanation of why the more southern forms of spruce are less desirable than the northern, and thus we gain an explanation of one of the factors which contribute to the great and recognized superiority of Canadian spruce over that of more southern latitudes.

LONGITUDINAL SECTION OF SPRUCE

If a thin slice of spruce be cut off lengthwise and placed under the microscope, it will be seen to consist of a series of very long and narrow cells with tapering ends. Whatever process may be employed in reducing this wood to pulp, the object to be achieved is to separate these various cells from one another as completely as possible, but without involving destruction. If we now take a slice cut at right angles to the first, or

TRANSVERSE SECTION SHOWING RESIN CANALS

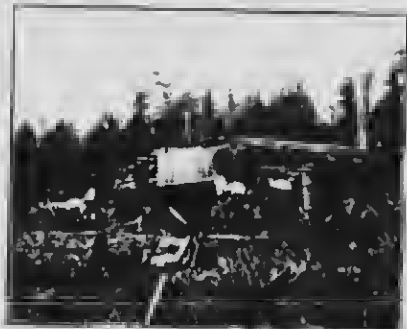
what is commonly designated as a transverse section, the various cells will appear as approximately rounded openings, and the cell walls seem to form a network of tissue. Here and there prominent openings may be seen. These represent the special canals in which the resin is deposited. While they are always

TRANSVERSE SECTION WITHOUT RESIN CANALS

prominent in the spruces, they are by no means uniformly distributed, and many sections will show no such structures. From these examples we are able to gather that the cells of the wood are in the form of very long, tubular fibres with tapering ends joined together by a substance which holds them in the form of a tissue. The difference in density exhibited by the structure of the last two photographs, represent variations in growth at different portions of the growing season. The more dense structure is formed at the close of growth for the year; it is therefore always on the outside of the growth ring and is known as the summer wood. The more open structure forming the bulk of the season's growth, is always produced during the spring and early summer when growth is most active; it is thus always on the inner face of the layer and is termed the spring wood. We

TRANSVERSE SECTION HIGHLY MAGNIFIED

may now select a limited area of one of the transverse sections and magnify



WINTER SCENES ON THE MIRAMICH



it much more highly—about ten times more. We are now enabled to see that each wall separating adjacent cavities, is in reality composed of three parts—one of which belongs to each of the cavities, while the third lies between and seems to cement them together. Whatever process is employed the great object to be attained is to so break up this middle layer as to completely separate the layers on either side. In the mechanical process this is accomplished by simply tearing the cells apart. In the chemical process the chemical agent employed is designed to attack the middle layer and bring about its solution to such an extent that the adjacent walls may be separated with the minimum of injury. The general nature of these processes and their results will appear shortly, but for the present we may return to a study of the further changes which our logs undergo after leaving the banking room. The logs destined

GRINDING ROOM

for the manufacture of mechanical pulp are now conveyed to the grinding room where there are twenty-seven grinders, each of which is provided with three or four hoppers. The grindstones are of very fine quality and are imported from Newcastle, the necessary supply for an entire year being procured at one time. Each stone presents a grinding face of twenty-six inches of which only twenty-four are actually utilized. In the process of grinding the blocks of wood are fed into the sides of the hoppers and held firmly against the face of the stone by hydraulic pressure. As the pulp issues from the base of the grinders, it is carried to a screening trough where the finer parts are separated from the chips. Thence it passes to the screening room where it is carried over a series of very fine screens which finally determine the fineness of the fibre. The

PRESS ROOM FOR WET PULP

now thoroughly washed and screened material passes into the room where it is carried through a series of roller presses from which it emerges in the form of wet sheets about 4-25 of an inch thick. These are then folded and baled and in that form constitute the wet pulp of commerce. No attempt is made to dry the pulp beyond the point at which it emerges from the presses, and it therefore goes into the market with 60% of water.

GROUND WOOD FIBRE

An examination of this wet pulp will enable us to understand the specific action produced by the grinding. The photograph before us shows

the microscopic appearance of the fibre under such conditions, and it will be seen that, as might be expected, the violent action of the grinding process has broken the cells of the wood to such an extent as to produce a short fibre, although the process as a whole has been carried out so well that the individual cells are well separated. It nevertheless

GROUND WOOD FIBRE

happens that the cells are not so completely separated in all cases, for nearly every specimen selected will show more or less numerous fibres composed of two or more cells. With these facts before us, it is not difficult to understand why ground wood fails to meet the requirements of a first class paper in which toughness and strength are considerations of the first importance.

CHIPS FOR SULPHITE

Returning once more to the larking room, we follow the second stream of blocks as they are carried to the chipping room. There each block is pressed endwise against a revolving knife which removes coarse chips of the character shown in the photograph. These are next carried by an air blast through a

REDUCING CHIPS

fan, by which they are reduced to small dimensions and freed from all dust. Thence by carrier they pass to the upper story of the Digester House where they are stored and from which they

THE DIGESTERS

are dropped into great iron tanks or digesters. Three of these are employed, and each has a capacity of ten tons. The digesters are great cylindrical tanks supported on end, and made of heavy iron lined with sheet lead with an interior lining of fire bricks—this double lining being essential to prevent the very rapid corrosion which would otherwise take place under the conditions of high pressure and high temperature employed in the digesting process. In order to understand the nature of the changes effected here, it will be necessary to trace our

THE SULPHITE TOWER

course next to the sulphite tower. This construction is a cylinder of 37 feet diameter and 100 feet high. It is built of brickwork and is supported

which it stands, it forms a most imposing landmark which may be seen from a long distance on the surrounding plain. Primarily the structure consists of a series of great wooden pipes bound together and braced by iron bands and rods to withstand wind pressure. The wooden pipes are filled with lime stone, and the entire arrangement is such as to present the greatest surface contact between the gas and water on the one hand, and on the other hand between the dissolved acid and the limestone, with which the pipes are filled. A series of pipes provide for the admission of the sulphur fumes into the wooden pipes both at the top and bottom, while water pipes provide for the introduction of water at the top.

SULPHUR RETORTS

In a small room at the base of the tower is a double series of retorts where the sulphur is burned. The sulphur is of a very fine grade and is obtained from Sicily. It is placed in large hoppers, whence it is slowly fed into the retorts at the base. As the fumes are generated, they ascend through metal pipes and find their way into the lime both at the top and bottom of the stack. As the water introduced above descends it dissolves the gaseous acid in large quantities, often to the extent of ten per cent. As this solution in turn passes down over the surface of the limestone, it is absorbed by and combines with the latter with the formation of a soluble bisulphite of lime which in turn passes into solution in the descending water, and it is thus eventually brought down to a large storage tank, where it is accumulated for future use. From this tank it is introduced into the digester, which has been charged with the chips already described. When the wood and the acid have thus been brought together, steam is introduced from below and the pressure is raised to 70 pounds. The digestion is carried on for several hours until, as determined by the experience of the operator and the indications of the liquor, certain changes have been effected. The nature of these changes is of great interest from a chemical point of view, but they hardly lie within the scope of our present discussion. Upon their completion, however, the bottom valves are opened, the steam pressure is reversed, and the contents are driven off into the "blow off" tank, after which a fresh charge is introduced and the process is repeated. In this way each digester receives two charges each day, and 60 tons of chips become converted into pulp. The "blow off" tanks are immense wooden constructions about three feet in diameter of corresponding diameter. They are provided with sieve-bottoms through which the washed pulp is forced into tubes, which in turn convey it to the sewer room. There it is passed over screens

and thoroughly washed, being at the same time drawn through the very fine meshes of the screens, which determine its fineness or quality. From the screen room the pulp now finds its way to the press room, from which it emerges in sheets of dry pulp about 3-64 of an inch thick, and in this form it is baled for export.

SULPHITE FIBRE

If we now take a portion of the finished pulp and examine it under the microscope, it will be possible to compare it with the mechanical pulp and determine the particular result of the chemical process, as also to ascertain the relative value of the two methods. The photograph before us shows the fibre in its original form, and it is quite obvious that each cell of the original wood has been completely separated from its neighbors, in such a way as to involve the least injury. Each cell is, in fact, seen to be complete, and it therefore appears as a relatively long fibre with a correspondingly greater value than mechanical pulp. The separation of the cells has been effected by a series of well-known chemical changes whereby the sulphurous acid has dissolved the substance forming the middle layer of the cell-wall.

MANILLA PAPER

Sulphite pulp is employed in connection with the various other fibres in the manufacture of paper, or it may be brought into combination with mechanical pulp alone. As an example of this use, the fibre obtained from a sample of heavy Manilla wrapping paper is shown in the photograph. It is seen to consist of sulphite pulp, which may be very readily distinguished, together with a certain proportion of mechanical pulp and fibres of other kinds.

In the production of these two kinds of pulp, about 75,000 cords of spruce are consumed annually, and the product amounts to 120 tons of mechanical, and 60 tons of sulphite pulp daily. Not all of this product is sent directly into the market, however. A certain proportion is utilized in the manufacture of material required on the premises, while a far larger portion is directly converted into cardboard for the manufacture of boxes to the extent of 30 tons per day, and into newspaper to the extent of 70 tons per day. For the production of the latter a mixed pulp is used, and this requires

THE BEATERS

to be combined in the beaters, which incorporate the fibres in the most complete manner. From the beaters the pulp then passes to the Fourdrinier

PAPER MACHINE, FROM THE WET END

machine, which distributes the fibres evenly upon a carrier. This latter is in

PAPER MACHINE, FROM THE FRONT

the form of a broad sheet, which conveys the pulp between a series of great rolls, from the last of which it emerges in the web, *voilà tout*. Here, however, it is made up into great rolls of paper, which are at once weighed, wrapped, marked, and shipped to their destination.

In addition to what may be termed the normal products of the mill there are certain important by-products which are developed as a feature of the economical working of the material constantly coming to hand from the forest. Thus there is a very considerable output of cedar shingles, while all the pine logs are converted into lumber to the extent of 25,000,000 feet per year.

Apart from these last items, it is of interest to note the disposition of the products. Of the 70 tons of newspaper produced daily, 1-3 goes to the Canadian market, while the balance goes to Great Britain — a portion eventually finding its way to Australia. The output of cardboard finds essentially the same distribution, while the pulps 1-2 to the United States, 1-4 to Canada and 1-4 to Great Britain.

It is impossible to discuss so important and extensive an industry as this, without having reference to the possible effect which it must have upon the forests, and its tendency to final exhaustion of the supply of raw material. We are all familiar with the frequently-recurring statements that the forests of Europe are in great danger of extinction, and that certain kinds of lumber, among which we may reckon the woods used in the manufacture of pulp, are becoming continually more scarce; and that if the present methods of lumbering are continued, there will shortly be an actual dearth of the necessary raw material, which must be obtained either by the use of substitutes, or by turning to those countries where the conditions are more favorable. In the United States the same warning note is raised with respect to the conservation of the forest supplies, and already there is a well-defined

movement in progress there to check the present evil and provide for the preservation of existing forests and a continuous supply of their products, in accordance with well-recognised principles which have long been in operation in such countries as France, and Germany, and Japan. Nevertheless, extensive as the wood pulp industry is, it must not be held responsible for the rapid exhaustion of our forest resources now in progress, since it appears according to the estimates of the Editor of *The Forester* that the percentage of wood annually used for the manufacture of wood pulp amounts to only 1.9% of all uses to which forest products are put.

In Canada, where forestry problems are attracting much attention, Mr. Langelier estimates that pulp-wood constitutes only 2.53% of the forest products devoted to all purposes of manufacture, and when this is joined to the enormous supply of available pulp-wood which our forests contain, it is easy to understand why other countries instinctively turn to Canada as the source of future supply, and that we are not likely to be troubled with precisely the same problems which are now causing so much anxiety elsewhere, at least for some time to come. We are also able to appreciate the fact that, leaving out of account the uses of timber for other purposes, the depletion of our forests does not lie with the pulp industry, but rather with the development of forest fires, destructive methods in lumbering and other causes, which are now in continual operation and are not completely, if at all, under the control of man. The wind, by uprooting trees where they grow in shallow soil and have poor anchorage, or by twisting them and developing open seams, which offer favorable opportunity for the introduction of decay, is oftentimes a source of great loss. Fires, which originate in a great variety of causes often unknown, are among the most serious of all the dangers which threaten forest growth, and the annual destruction from this cause alone is enormous. To these agencies must be added those which proceed from the ravages of insects and the action of water and ice, and the sum total of the destruction is one which may well disperse a thoughtful mind to serious reflections. The agencies, however, are all to be included in what may be termed natural causes, and were the balance of things not disturbed by the artificial conditions which are introduced by the hand of man, our forests would be likely to enter a period of equilibrium, but, on the other hand, they would probably increase in number and size continually. While it is not my present purpose to enter into a detailed discussion of the natural agencies of forest destruction, it may be worth our while to give our attention to some of the influences operating to the same end, but introduced through the agency of man, because they fall within the category of preventable causes, and demand consideration which

will tend to direct public attention to existing abuses in forestry management, and thereby arouse a healthy sentiment of protest, should be encouraged on every available opportunity.

The general method of lumbering as carried out at the present day, involves a waste of valuable material which often amounts to a high percentage of the entire cut. What this waste is may sometimes be ascertained, but in the majority of cases it is impossible to form any adequate measure of the destruction wrought. At the present time there is a fortunate and increasing tendency to avoid loss and needless waste, but in the majority of cases, there is yet room for improvement in this respect. In the United States where attention is being directed to a careful scientific investigation of all the facts which lie at the foundation of forest depletion, important data have been collected with reference to special forest areas, and these will serve an important purpose in guiding the formulation of a general policy of protection and control. In the Adirondacks, favorable opportunities have been offered for the prosecution of such studies with markedly advantageous results, and in considering some of the forms of waste which may readily be corrected, as well as in dealing with the general question of reforestation, I shall avail myself of the valuable data collected by Mr. Henry S. Graves as embodied in a bulletin issued by the United States Department of Agriculture.

HIGH STUMPS

One of the most common forms of waste is to be found in cutting the tree too high, whereby a stump of unnecessary height is left. A story having reference to the early days of Maine, when the great forests extended much further south than at the present time, may serve to emphasize the point at issue. In those days the practice of felling trees during the time of very deep snows, resulted in leaving stumps of varying height, reputed to be upwards of twenty feet. A certain merchant of a Massachusetts city not more than one hundred miles from Boston, having occasion to visit the State in search of land, sought to take advantage of these high stumps for purposes of observation. Selecting one which commanded an extended view, he laboriously climbed to the top, but having taken no precautions against possible catastrophe, he was suddenly precipitated to the bottom of the hollow trunk where he had abundant time to reflect upon ways of escape. After many fruitless efforts to escape, he was resigning himself to despair, when the light above was suddenly blotted out and he heard a heavy falling down.

The thoughts of release were now turned to an idea as to his relations with the unwelcome visitor, but as brain came near an inspirations sized him. He caught the animal by the tail and both steadily arrived at the summit of the stump where they quickly parted company. It is altogether unlikely that our story could find a modern illustration among the present timber limits of this continent, nevertheless, much needless waste still arises in this way. Ordinarily the tree is cut at that point at which the eye naturally falls in chopping, and this is, usually, three feet from the ground, a height which may readily be increased where there is much snow on the ground. This has been proved to be entirely unnecessary, the experience in careful methods of felling shows that a height of from 17 to 20 inches is all that is required. The loss arising from leaving high stumps amounts to 2%, which means that for a tract of 10,000 acres yielding 15 standards per acre, 2000 would be an actual loss of 30,000 standards, and this at a stumpage value of 40 cents would represent a money value of \$12,000.

TREE TOP CONTAINING A GOOD LOG

Carelessness or indifference on the part of lumbermen is accountable for a very large measure of waste. This often arises from the rejection of all material under a certain size, and this finds an illustration in the photograph before us, where we may see a tree top which has been left behind although it contains a good log.

SECOND SPRUCE CONTAINING TWO LOGS LEFT STANDING

It may happen that in felling a tree it becomes lodged in those about it, and rather than take the trouble to bring it down, it is left standing, even though it may contain two or more good logs. The loss arising in this way and the rejection of good tops, amounts to 6.3% of the material actually used. But, inasmuch as such material often represents that which is of inferior value, the money loss is much less than in the case of high stumps, and, reckoning it at 0.95 standards per acre at a stumpage value of ten cents, the actual loss would be \$95.00 per thousand acres.

SKIDS LEFT IN THE WOODS

Skidways are in most cases built of spruce, which is especially adapted to the purpose because of its clean, straight trunk and rough bark, and also because of the ease with which it may be landed. After use the skids are

nerally left in place and the loss thus arising amounts to one tree per acre, or 250 standards to the 1,000 acres, which at 40 cents per standard, add amount to \$10,000.

ROAD BUILDING ON STEEP

When a road has to be cut through the forest, the necessary felling is accomplished by cutting spruce trees and laying them in a narrow roadway cut. The loss resulting from this practice is considerable and variable, and cannot well be estimated, but in many places, as in certain regions of New Brunswick, compulsion has been brought to bear upon the contractor to make an orchard wood instead of the more valuable spruce, and these efforts have not with entire success.

SPRUCE CUTTING BRUSH TO CHECK SLIDS ON DOWNHILL

Whenever it becomes necessary, on steep inclines, to check the speed of descending sleds heavily loaded with timber, it is not uncommon to fell spruce for the exclusive purpose of securing the brush which the tops afford. This is spread over the roadway along which the sled must pass. In the vicinity of such places the spruce is commonly all cut away, but the trunks are always left where felled, to the operation of decay.

In approaching the important question of reforestation, as applicable to lands from which the growth has been more or less completely removed, there are three primary factors to be taken into consideration:—

1. The possible acceleration of growth as the result of thinning.
2. The average rate of growth of a tree in diameter.
3. The possible yield of a forest in stated periods after the first cut has been made.

Upon a satisfactory answer to these questions, the entire subject of reforestation as a process justified upon economic grounds, to be executed by the individual, or the corporation, may be said to depend, and I shall therefore endeavor, briefly, to indicate the results which have been obtained in this direction, and point out the inferences which they seem to justify. And here again, I shall avail myself of the very important data obtained

by Mr. H. S. Graves, in connection with his studies, prosecuted in the Adirondack region, under conditions which give them exceptional value.

In regions of dense forest and cool climate, a deep layer of humus, derived from the decaying foliage, accumulates upon the forest floor and serves to retain enormous volumes of water which is liberated slowly, and finds its way to the adjacent streams. If now such a forest be thinned, and freer circulation of air and the greater access of the sun's rays serve to bring about a more rapid disintegration of the humus, with the result that an increased amount of plant food becomes available, while the drainage of the stored water will permit the roots to be influenced by a somewhat higher temperature. These conditions serve to explain the immediate increase of growth which is consequent upon them, but it must also be evident that as the humus is gradually exhausted, the effect will be a diminishing one, and it must finally cease altogether. How long a time will intervene before this takes place is not altogether certain, but Prof. Hartig, of Germany, estimates it, under favorable conditions, at a limit of ten years. In addition to these influences, it is also true that the thinning of a forest tends to the development of a larger and more efficient root system for the absorption of food supplies, and, similarly, to the development of a more perfectly-organised system for the digestion of such food materials as may be furnished by the roots and leaves. There are, in other words, more perfect conditions for the individual development, and this is expressed in an increased growth, both in diameter and height.

AVERAGE RATE OF GROWTH IN DIAMETER

From a critical study of 1,500 trees, Mr. Graves has been able to reach the conclusion that the effect of thinning produces accelerated growth to the extent of 18 per cent., and that while, in the original growth, it required nine years for an increase in the diameter of one inch, thinned timber required only five years to attain the same increment.

From these and similar studies, it has been possible to determine the periods of time within which a forest may recover from the effects of the first cutting, according to the dimensions of the trees left, and these data are reduced to tabular form, in what are designated as Yield Tables.

YIELD TABLE B

From these tables it is possible to determine by simple inspection, what period of time is required before a forest may be cut a second time with equal profit. From such data as these it appears that the most immediate results are to be obtained by cutting the forest down to a dimension of five inches in diameter. But such an operation would be eminently unwise, as it would require from 50 to 75 years for the trees to regain their original dimensions, while the extreme diminution of the seed-bearing trees would add another element tending to delay in re-stocking. During the long period thus required for recuperation, the accumulation of interest charges and taxes would not justify holding the land, for the relatively meagre crop to be obtained. From such facts as these, it becomes evident that where forests have been cut clean, or even in cases where the growth has been reduced below a certain limit of size, it will be impracticable for any individual or business corporation to undertake the reforestation with a view to ultimate profit, and, under such circumstances, it becomes an operation which can be carried out successfully, only when under Government supervision and control.

It is, however, quite possible to cut over forest lands in such a way as to ensure continuous and profitable returns within reasonably short periods. Thus, if the inferior cutting limit be ten inches in diameter, the same yield may be obtained at the end of thirty-six years. If, on the other hand, the inferior limit be raised to twelve inches diameter, the same quantity of lumber may be cut in twenty-four years; and yet again, if the inferior limit be raised to fourteen inches, an equal amount may be cut at the end of nineteen years. It by no means follows, however, that the best results are to be obtained by following this course of reasoning to a strictly logical conclusion, since other factors must be considered. Thus, 30,000 acres, yielding an average of 3,000 feet of lumber per acre, when cut to a limit of ten inches, will yield 2,700,000 feet per workable area of 833 acres. If cut to a limit of twelve inches, the yield will be 3,125,000 feet from a workable area of 1,250 acres; and if the limit be fourteen inches, the yield will be 2,425,000 feet from a workable area of 1,570 acres; whence it appears that it is altogether most profitable to cut to an inferior limit of twelve inches, making the equal cut in periods of twenty-four years.

These facts then seem to justify the view that the proper remedy to be applied to our forests, is to be found in such laws as can or in such conservative methods on the part of the lumbermen themselves, as dictated by their own best interests, as shall prevent all cutting to exceed a limit of twelve inches diameter, guarantee permanent yield in the rate of growth. Such measures are obviously available to secure the growth of original forest growth, in which the average diameter of trees is never cut out beyond these limits, and by constant replanting, the forest can be maintained in a systematic condition, in which the average diameter of trees is never cut out, and the forest can be maintained in a condition of permanent yield.

Our lumber camps are in general, in the depths of the woods, and are represented in our study by the large mill, in a rural operation, but also by those which are projected for construction in the immediate future. It is impossible to avoid a consideration of the conditions which exist in the lumber camps, and the relations in which the mills stand to the community in which they are placed, and from many points of view, these are some of the most interesting phases of our subject.

Anyone who has visited a lumber camp in the depths of a forest, far removed from the restraining and elevating influences of even a small community, will readily appreciate the demoralizing forces which constitute an invariable accompaniment of such conditions.

In 1900 a movement was inaugurated looking to an improvement in the condition of the men gathered in the various lumbering, mining and railway construction camps throughout Ontario. This movement seeks for the operation of a travelling library commission similar to that which has been in successful operation in the United States, and to secure to the various camps suitable sanitary inspection and medical attendance; reading and writing accommodations and instructions. It has received the cordial endorsement of those who are directly interested in employing labor of this class, and many employers are now taking active measures for the betterment of their men. Under the intelligent and enterprising guidance of Mr. Alfred Fitzpatrick, who acts as secretary and agent, the Reading Camp Movement has become an established force wherever a camp is to be found.

READING ROOM, BOOTH & COMPANY'S CAMP

Various lumber companies have erected special buildings for the accom-

modation of reading rooms, and excellent examples of these, in the form of comfortable log houses, are to be found

WALLACE, McCORMACK & SHEPPARD'S READING CAMP

HALE & BELL'S CAMP

ONTARIO LUMBER CO.'S READING ROOM

In addition to the newspapers which find their way into these reading rooms, travelling libraries are received from the Department of Education for Ontario, and from the library of McGill University, and the special stimulus which is thus given will be greatly enhanced in the near future under arrangements now in process of completion, whereby the series of illustrated lectures delivered before this audience, will find their way into every camp.

PORTABLE READING CAMP

The Lake Superior Power Company, and the Algoma Commercial Company, are now providing a more comfortable and portable type of reading room of the character shown in the plans, and these will, no doubt, replace the old style of log house in many instances.

THE LAURENTIDE MILLS

The Laurentide Mills were established in 1897. At that time the town of Grand Mere was a mere village of only 400 people; but it has now attained to the dignity of a City, with a population of 5,500, all of whom are either directly or indirectly supported by the pulp industry. In and around the mills, about 850 men are constantly employed, and at times this number reaches a total of 1,000; while the lumber camps represent a total of 2,000 men constantly engaged in the various operations of the forest. There are, therefore, about 3,000 men dependent upon this one establishment.

The town, which at present has all the appearances of one which has but recently been brought into existence, is a progressive one, and works now in process of completion indicate that, at no distant date, it will present in its broad and well graded streets, in its substantial buildings, and in various other ways, evidence of a prosperity which will make it compare favorably

with other towns of similar size. At the present time an efficient electric light system is maintained by the town, while an adequate water service is supplied through the Mill.

To the casual observer, the influence of the Mill, both directly and indirectly, in promoting the general advancement of the community interests, is very marked, but this influence is found to extend beyond the town itself far into the more remote regions of the surrounding country. Here there has been created a new market centre, to which the farmers may bring their various products, especially of hay and grain, and from which in return they may gain many advantages previously unknown.

The religious life of the community is cared for by three churches—one Roman Catholic, one Church of England, and one Presbyterian. On the other hand, the intellectual life is not as adequately provided for as it should be, and as, no doubt, it will be in a few years, and this is owing to the complete absence of public schools. With respect to the Protestant section this deficiency is partially offset by private schools, the most noteworthy of which is maintained by the Rector of the Church of England, with an attendance of about 35 pupils.

Situated as it is at a height of about 400 feet above tidewater, and just on the confines of one of the most beautiful of all hill countries, Grand Mere not only possesses exceptional sanitary advantages from a local point of view, but from the broader standpoint of a resort for those who are in search of conditions which will serve to invigorate both mind and body, few places could be more attractive than this. It has been suggested that the constant presence in the atmosphere of small quantities of sulphur gas from the sulphite tower would prove to be beneficial to those suffering from pulmonary troubles. However true this may be, it is certainly true that the clear, bracing and absolutely wholesome atmosphere of this region would prove a most important factor in such cases.

The possibilities of the location for industrial purposes have by no means been fully developed—indeed, we may say that but a small beginning has been made in this direction. The Laurentide Mills at present utilize only about 18,000 horse power, which represents but a small fraction of that which may be developed under conditions such as obtain here with an enormous volume of water and a working head of 15 feet, and we may look forward to the future industrial development of the town with a feeling of confidence that it will become of far greater consequence than at present.

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Hon. C. N. Skinner, K. C., of St. John, was then introduced.

HON. C. N. SKINNER, K. C., D. C. L.

"FORESTRY WITH ITS RELATION TO AGRICULTURE."

Mr. Chairman, Ladies and Gentlemen. — If I should go on with my address, I do not know quite what would become of Mr. Emmerson's address.

he has hitherto proved able to take care of himself, but I notice Mr. Emerson's Address is to be on "Opportunity and Outlook." I am certain he may have the "outlook," but he will not have the "opportunity."

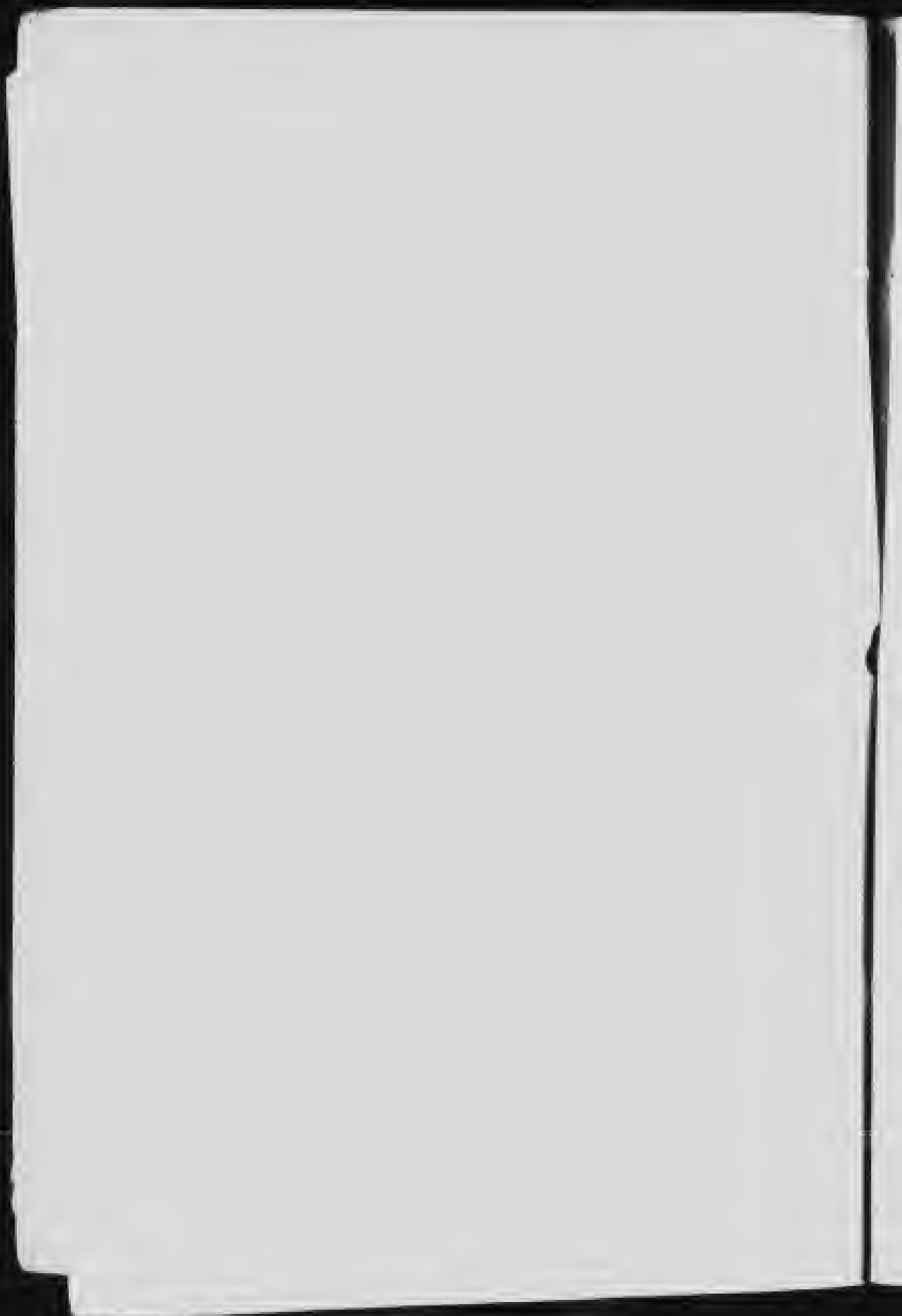
I had intended to take a little time to prove my right to be here, that is to say, to speak on behalf of Agriculture. I met a gentleman this morning, who took a very prominent and a very creditable part in the programme to-day, and he told me that he would like the opportunity to hear me very much, but that he wished he had brought with him another gentleman, naming the other gentleman, because, he said, the two of us could say more on anything we did not know, than anyone he knew. It is under those circumstances that I come before you at this late hour, and under this difficulty to speak. But I shall not trespass at any great length—most prosy people say these things as I am saying them now, so you need not take too much stock in them, you know.

At first it seems singular that in a great Convention like this, which is primarily called for considering the question of lumbering, the farmer could be in any way interested in the matter at all. He is a good deal removed from the business, but if you go back to the farmer's calling, trace the natural history of it, you would find it very easy to make out his case, and to show to an audience like this, that it requires grave consideration in settling what is to be done after this Convention adjourns, as to the effect of the whole matter upon the agriculture of the country.

The Creation of the world, Ladies and Gentlemen.—I thought, having so much time, I would commence away back—so far as I have any recollection of it, had only one purpose in view.—that was, to produce a Man, and in that, of course, was included Woman also. Well then, when the world was finished and ready for man, Nature gave up the work of creation, and said, in effect, to man: "Now, you go on with the work that has been brought thus far forward." Nature does not finish anything: Nature ends with producing the material, and the earth, and man, and leaves it for man to carry on the work. Nature builds no railways, no mighty steamships, none of those great works that manifest the modern labor of mankind: all that is a delegated operation, given to man to carry forward, after the main part of the work had been finished. But man has not proved true to his trust: man, instead of becoming the builder, as he should, became at once a destroyer. He has destroyed almost



LUMBER SLEEPS IN THE M'RAV H



everything upon which his hand has rested, and the first thing that he ought to destroy was himself. When the great creation was given to man, there was a great responsibility resting upon him, and he was expected if he wished to become a success, to go along the lines of reason and duty in the work, but he thought he knew better than that with which Nature had provided him, and he managed the whole thing himself, and you know what a mess he made of it. And when the lumbermen began to work and take out more lumber than they want, and hack the trees that he set up when they should cut them down close, and do all the other things that annoy lifetime I had heard the lumbermen charged with it in the past, and they have only carried on the work of their forefathers, and done the work as badly as they could. Now, this Convention is called for the purpose of setting these gentlemen right, and to say to them, "The work has got to go on a little differently from what it has been in the past." This is not said in an offensive sense, but said only to advise this is one of the reasons that this Convention was called, because the lumber business has been too encroaching upon the materials which they operate, and the Legislature and the people have to step in, to ask a consideration, which I know the lumbermen will give, in order that we may do better in the future.

Now, when the work was taken up by man, and as I say, he sought to destroy himself, the world did not advance very much, and all persons who operated, not only the lumbermen, but every person else, seemed not to have done as wisely as they might have done. In this and go on, the world would not have been finished, it would not have been fit for man to have inhabited, nor for him to operate upon its face, if the trees had not been produced; it was not a finished creation anyway, until the trees were there. A world without trees would be uninhabitable, men could not have lived without trees, it would have been a bare, barren waste. It is the trees of the country that stand between the world and desolation, and therefore if man destroys the trees, he is doing away with the great inheritance that was given to him. Nature bequeathed to him everything, all the raw material of the world; all the natural resources of the world were given to man, and the trees were required to do their part in carrying on the work. Well, we know he did not carry it on properly, because, as I said before, he first destroyed himself as far as he could. Let me say this, I believe, as many of you do, that if man had not by improper courses of conduct shortened the days of his life, we here tonight would have the glorious heritage of probably 300 years to live upon this green earth upon which we now stand. These natural resources of creation that were given to man to operate, you

know what to do with them and what has been done with them and how they have been managed. Well, in my opinion, as to the farmer is the great laborer of the earth. The earth was not prepared for pulp mills, the earth was not prepared for railroads, but it was prepared for the agriculture of the first and here tonight we meet some grade of the primitive man on behalf of the man as he has become educated and elevated and enlarged in his intellect and prepared to do the best he could. I stand here for that class of people, who are the laborers and the finishers of this great work. The world was made for men to live on and they could not live without the farmer; the farmer was the great thing that was worked out and stirred out in the creation of all we behold and all we remember. Well, that being the case, the farmer too has not done his work very well; the farmer, as he has operated along all the lines of his business, has destroyed the trees almost whenever he could destroy them, and even today, unreason why the great immigration into this country is going to the West, is because there are no trees here. But the great West would not exist if it had not been for the crops of trees that for numbers of centuries in the past grew and fell and was moulded into that great alluvial plain, which is the body and grandeur of the West. But here in our country, when the farmer undertook to settle it, he took an axe and destroyed all the trees he could see, that he came in contact with. I remember going up the Tobique some years ago and was astonished at the beautiful land. I thought I never saw more beautiful land and you could hardly catch sight of a tree over all that beautiful country. When the farmer began to settle this country he went into the wilderness and cut down the trees and now the lumbermen requires the intervention of the law in order that he may be successful in his operations and his work.

Now, you say, "how is the agriculturist interested in the trees?" In the first place, take the head waters of all our rivers and our streams. If you destroy the trees around these head waters, you destroy all the farms finally that are on the banks of the streams flowing down through the land. I am told, and I believe it, that in old summer now, on the River St. John, the River gets about two feet lower in the dry time of summer than it did say half a century ago. That is because the trees have been cut from the head waters and the banks of the streams and if that goes on, it is going to bring desolation— it may be a century hence, but it is bound to come; therefore it is that the lumbering business should be carried on so that the head waters of the streams will be protected, and that is a part of the business of trees, whether at the head waters or other places, trees operate in keeping

the water there, they hold the fluidity within and under their branches, keeping it in such a way that it does not go down quickly, but is held there, so that it may be sent forward during the dryer times of summer, in order that the farms may be fructuated and cultivated. In India, which was one of the finest wooded countries the world has ever seen, and has had some of the finest trees the world has ever interferred with, one of the peculiar things is with regard to the palm tree, which is so luxuriant and abundant in all these hot countries. I remember to have read years ago, one writer said, "The palm tree loved the heat," and so it is in vegetation, if you choose to trace it out, there is almost an intelligence within vegetation itself, and I know, within my own knowledge, where a luxuriant vine grows up, and where there is a tree five or six feet from it, that vine will reach out, endeavoring to catch a branch of the tree for support. How does the vine know the tree is there? It has a sentience in itself that causes it to move forward. And so it is in reference to the trees destroyed in our own country. There is only one principle of life. The same principle of life that is in man is in the insects, in the trees and in all we see around us that has life; and therefore it is that when the lumberman and the farmer cut too closely into the forests, they are severing lives that ought to be allowed to live, on the same principle that their own lives are preserved.

Speaking of India, it has been found that where the mountain sides have been denuded of trees, and the waters cast forth unduly, so that the country cannot be kept in its proper state with reference to growth, it has been the cause of many of the famines in India and the same thing has taken place in China. Therefore it is that we are called upon to look to the future and to guard against these things. A man will go after the fish in a stream and even follow them up to the spawning beds, and so obliterate the fish from the country. One of the reasons for this is that man only cares for the present. There is not a man here tonight but what, if his country called for him to go forward and die on the field of battle for his country, would go; then he would be fighting for posterity; but he would hardly sacrifice fifty cents for the good of those who will come after us, when we are passed away. We are defending our country in this Convention as truly as men defend it on the battle field, although we are doing it at less risk and very much less cost. Therefore it is without going any further into this matter, and I am not speaking to you tonight as I had intended to speak, but am only making these few remarks to show you what is required, even for the protection of agriculture—if the trees are not kept for the farmer, the farm must become desolate—and if the farmer strips his own farm of trees, he will make it still

our interests, and we must, if necessary, take some steps, and make the Government pay all the waste papers on his farm, as well as the mills. We have credit here, but we will care not for more, and interest in the success of farmers. We who are not farmers, are interested in the success of the lumbermen. Therefore, I want to impress upon you that the necessity exists that a Convention like this should be called and that the Convention should not only be in a time when it does, but keeping its eyes to the future, it should see that no body of citizens matter how wealthy, or how long standing, should not waste themselves, and so, as the community in which they live, and who have the same rights they have.

There is no time to speak of now. I have to go on, and I will, with you, I am pleased to see that you have the opportunity to see and hear what has been done, and to see that I think the day will have enough to do for the glory of our country. I know of these things, and I am wondering about them for a long time. The only country we have is our own and that is the principle we go on. We want to see our country flourish, and to do that, everyone must do his duty, as we have been doing here today. And I trust the time will come, and, possibly, too, when all these interests we have been talking about today will join with us in recognizing that he who loves his country will do something for it, and when that is the case, we may turn our eyes to the future, and although we may not see the good results our efforts will have made, we will have this sweet and glorious thought in our own minds, that we have made our country what we desire it to be, and under our flag, with the protection of our Constitution, beside the great Institutions which make this Canada of ours and the great possessions of our Empire, to say nothing of the central forces of the Empire that make the glory of our Institutions, and with the memory of our fathers, we are marching forward, with our eyes to the future, hoping for our country, acting for our country, and determined to do our duty in whatever position we are.

Hon. H. R. Emmerson, Minister of Railways and Canals, then made an address.

Mr. Tweedie, Ladies and Gentlemen,

I am assure you it gives me very great pleasure to be in this Chamber once again. There have been occasions when I was here and, I have heard, more than once, a plea put forth on behalf of the

farmer as my friend, and my sympathy for him has continued. That used to be a very common way of padding out a subject, by saying a word on behalf of the farmer.

It is not my purpose at this hour or this time to champion anyone's cause. I did come with two messages, I will content myself with delivering one, and I will leave you to imagine as to how I might have delivered the other.

You will have observed in your program that it had been stated therein that I was to speak on "Opportunity and Outlook," and as I sat here and saw the opportunity needing—and I was not very sorry—I began to realise that the outlook was a much brighter one for me than it might otherwise have been.

In the first place, Mr. Premier, I want to say that I have an especial pleasure in being here with a message from Sir Wilfrid Laurier, who, as everyone knows, has taken a very deep interest in forestry. He it was who first called together a convention in this Dominion to discuss this subject, a convention which was a very great success and which had attendants from every province in the Dominion, and a convention which I am bound to believe was fraught with very much good to the whole Dominion.

I think that it might fairly be said that the very fact that there has been since a Provincial Convention is due to the fact that Sir Wilfrid Laurier, taking the deep interest he did, took the initiative and convened those who were interested in the matter at the centre of Canada, at Ottawa.

I am glad that New Brunswick is taking a deep interest in this matter, and that those of every political faith, without regard to party discussions, have become interested in a matter so vital to the best interests of the Province of New Brunswick.

When invited to come here I was not certain that it would be possible for me to come, owing to the fact of your Convention being held at a time when, as you can understand, I would have other engagements elsewhere, but when I went to my leader and spoke of the Convention and of my desire to attend it he gave his consent at once, and said that if it could be possibly arranged I should come, and as I came away yesterday afternoon he wished me to convey to this Convention his greetings, and the warmest wishes that it might prove a very great success and prove

a boon to the people of New Brunswick, which is so deeply interested in the subject. (Cheers) I therefore have very much pleasure in conveying to you those greetings. He regretted very much that he could not be present, and I am sure we would all have been delighted to have him, but you can very well understand why it was not possible for him to attend.

I have said that is one of my reasons. Another, or rather one other reason which actuated me in the desire to come was this, that in the Department over which I have the honor to preside we are not a little interested in the matter of forestry preservation. I know I have a Deputy Minister, a very able man, who is very keenly alive to this subject, and I believe that at the instance of the Convention which met at Ottawa, and of the Executive connected with that Convention, that he is paying particular attention to the preservation of forests from destruction by fires caused by locomotives, and is making a special study of an improved scheme with regard to locomotive smoke screens. Therefore, by reason of my association with him, I have been called upon to take a much deeper interest in the subject than I otherwise might have had.

I would not for a moment detain you to talk on the relationship between the transportation problem and your forest wealth in New Brunswick. I know that, all over Canada, not merely here but throughout Canada, people are interested in the extension of railways. I know that the problem in relation to transportation is of interest to all, and that every man in his own way is endeavoring to solve it. Every man knows in a measure how to solve it; and this leads me to my own idea, to which I might make reference.

They say everything depends on the title which you give a book, and that in writing a magazine article that very much indeed depends upon the caption of that article, and I suppose it follows, as a natural consequence, that whenever you are going to say anything, especially if you have not very much to say, a good deal depends upon the subject that you announce you are going to speak upon.

Now I might just as well have chosen some other subject. I realize that now, because the opportunity is gone, and I want the outlook, as I said before, to be bright for posterity, are two little words often used that might just as well have been chosen. These words are, "I said."

Have you ever observed, in the ordinary conversations which take place between man and woman there, these words are a very frequently used perhaps

than any other words in the English language — "I see" — and very often they don't see. That begin, I fancy, in the days spoken of by my friend, Mr. Skinner. — I fancy that Adam used those words, "I see"; but Mr. Skinner has proved that Adam didn't see, and didn't know very much about it anyway, and there have been very many who have followed in the footsteps of Adam with regard to a feeling of assurance on their part that did see when they didn't see. And as I think of the past history of New Brunswick — and I need not go outside of the County of York for illustration — when I think of what has occurred, and the waste that has resulted, by the destruction of very valuable property, I begin to realise, and you too will realise it if you think of it, that there have been a great many men who have not seen, and if they only had seen what a difference there might have been!

Mr. Skinner has spoken of the results as to the destruction of the forests. — Did you ever, canoeing along your river banks, or going up and down the beautiful St. John, view from the decks of a steamer the waste to be seen on the shores and banks of that river? — Did you ever walk through a wide road in any section of the country without observing the waste and the result of destructiveness? — Did you ever, in going across the farm lands, look at the fences? — Those of you who are as familiar with the northern section as I am will recall the fact, that there is not a county along the shores of the Northumberland Straits but has suffered from waste in the very matter of cedar fences to such an extent that the cedar in them would more than pay — and I would say it is not an extravagant statement — would more than pay your public debt for the province of New Brunswick, if you had all that waste at one spot today, having regard to the market value of that cedar.

You can go — through the County of Gloucester from one end to the other and today see the remnants of magnificent cedar fences, and the same is true with respect to the Counties of Northumberland and Restigouche, and you will see in those cedar fences great, immense logs. — Look at the value. — I am not going to talk shop to you, but I have realised in the three short years in which I have presided at the head of the Department of Railways and Canals — I have realised, because it has been brought to my notice month after month, and week after week, and day after day, that the values of cedar, in fact, of all classes of lumber that are required for material in connection with the Intercolonial Railway, have, in many instances, doubled, and in others certainly there has been a fifty per cent. increase, and this is not, as a good many imagine, by the purchase of material without

and more so. This is not as the mis-advisee respect to dividend material, after the application to the railway post office and public grant from one end of the railway to the other, and owners have been invited to furnish this material at prices at which they were disposed to obtain it—mark, in the first ad, that petition, that all lumber material has more or less certainly in very few instances less than 27 per cent., and in some instances 50 per cent., and even in others, with respect to pine and fir, among other classes of lumber, there has been an average of hundred per cent. increase.

Now put these vibrations gathering together, that you would in your mind's eye, by the visits you have made to the rolling seasons of the province, and in the different counties, and also the amount of waste there has been, and also the amount of waste going on every day, and then apply your mathematical ability, and multiply that waste by the value of this lumber today, and it is not only its value, it is because of its scarcity and because of the necessity.

I don't think there are many men in the Province of New Brunswick who can stand up and say that there is to be found within our boundaries any very great quantity of what even twenty or twenty-five years ago would have been called first class pine. If there is any very great quantity it certainly is not seeing a market. If there is any great quantity of that particular class of pine, or there is not much evidence of it anyway. Not that have been if people had seen.

I feel that there is a time now for people to see, and I fancy, Mr. Premier, that in your gathering here that you who have had the opportunity of listening to and partaking of this feast of good things, that even of the crumbs that have fallen from the table of today's feast there would be gathered much that would be of value, and there would be, if it could be retained in the memory and could be disseminated, the knowledge which has fallen from the lips of the eminent gentlemen who have addressed this Convention today. If the truths which have been imparted could be disseminated through out the province, among the young men, the growing hope of this country, it might make many of them see where they have not seen, and if they only could, we are not just beholden as a province.

A great many people are looking away beyond to the West, and a great many young men, as I know, are looking to the distant pastures; but are we prepared to say there are no opportunities in New Brunswick today in

in connection with our lumbering possibilities. I think too I quote the young man. I know we have our lumber kings today, and we have to my sorrow, hundreds I might almost say, who have not very eminent success in the conduct of their lumbering operations. But is all hope gone? Can you not pierce the veil and see any hope beyond for those who are to follow in their footsteps? And if there is that hope, and if it has reason to exist, should not this province for itself see to it? Is it not the duty of everybody, not merely of governments, but of opposition as well? It is the duty of every representative of the people, every man who has the honor of sitting here in this Chamber as the representative of the people, it is their duty to see to the future, and I am proud to know, and I certainly do congratulate the present Surveyor General upon the steps which have already been taken within the last two or three years, with respect to the preservation of your forest wealth. I know that gradually, year by year, going back many years in the history of the province, there have been attempts made to legislate along those lines. But I have realised this, and I have realised after an experience of public life of some years, that the mere enacting of legislation does not hit the mark always. It is declaratory, and very often laws are passed upon the theory, "Oh well, it is a declaration of principle anyhow." There is, too much of this declaration of principle, and too little of the execution of principle.

It reminds me of a little story that perhaps might be appropriate, as it relates back to a few years ago when I was responsible for legislation in the Province of New Brunswick, that is, measurably responsible. I was invited to amend the License Act in one particular, and that was to this effect, that no man, be he guest or otherwise, should be permitted to drink a glass of wine at a hotel in the counties where the License Act was in operation. As to what they did in Scott Act counties, that did not count; but this was with respect to the License Act, and the delegation on that occasion was very earnest. I am sure they were very sincere, and thought that perhaps very much good might be accomplished; but after listening to them I asked them this one question—a pointed one. I said: "Why do you want that?" And the man stopped and thought. I said: "Will it prevent them, would it prevent the guest in his room or at the table?" "No, it would not," he admitted. "Then," I said: "Is there any way whereby it could be enforced?" "Oh no," he replied, "we don't expect it to be enforced, but we want it as a declaration of principle."

Now that is my idea of legislating. That is an illustration; and in the

direction which you are legislating with respect to the protection of your forests, and in the matter of the renewal of your forests, you should not content yourselves merely with a declaration of principle, but have it in the direction or in execution of a principle.

I feel that perhaps it is just as well I missed my opportunity, and I can only hope that the outlook for the Province of New Brunswick will be as bright and as successful as the faith I have in that province.

A vote of thanks was passed and extended to Sir Wilfrid Laurier for his good wishes for the success of the Convention.

MR. STEWART: In Quebec they expressed a particular desire to put an export duty on pulp. The proposition stated a cord of pulpwood in Quebec was worth \$6.00, in pulp \$16.00, and in paper \$36.00, showing the great advantage of having the article manufactured in the country.

HON. C. W. ROBINSON,

Speaker of the House of Assembly, N. B.

I see I am down on the programme for an address on "Lumbering Methods." I suppose there are a great many to address you, my remarks will be brief. I know a little about practical lumbering, but perhaps I do not know everything about lumbering methods. This question might be divided in different ways. There might be the superficial methods, and according to some people the underground methods, or we might make other divisions. I think, however, the Surveyor General intended the discussion to be with regard more particularly to one or two things, — to be a fair-minded, fair-minded, fair operations so as not to injure the growth of the young trees, may more than can be helped. The old operations, such as lumbering, everything, in sight and in the woods; but I think the lumbermen in New Brunswick at the present time can understand you well they will not do anything like that, and it is not necessary to follow a method which has been established as well understood.

I think Mr. Legge stated that timber land is worth \$40 an acre. Now I have done some mental calculation along that line, and have asked some questions of lumbermen. I know of my own personal experience in the County of Albert, that timber lands sold at a great deal higher rate than that. Those of you who are from that County, will know that, in one case, somewhere about seventy acres of land sold for \$7,000, and within the past year the A. L. Wright Lumber Co. purchased in that County something over 175 acres of land for the sum of \$25,000. That seems a pretty high figure, and it is the highest I know of. It figures about \$150 per acre, and it was understood at the time that there was about four million feet of lumber on that property, of which about one million feet was pine, which only goes to show that the stumpage in that district was worth about \$6,000 a thousand, and I have heard of other sales in the County of Albert as high as \$7,000 a thousand.

I am not here bound by any particular rules or regulations. In my position as Speaker of the House of Assembly I am not supposed to be supporting any Government or party, but am a sort of a free lance, and I would like to stir up some discussion on these matters. We have heard a great many valuable papers, but we want more debated discussion on the part of the practical lumbermen and others, and if I could say something to stir them up, I would glad to do so, even at the risk of offending some of them.

The statement has been made that at the present time the Government is receiving stumpage on about 120,000,000 feet of land, one of the prominent lumbermen on the North Shore has said that the annual growth of black spruce in this Province is 70,000,000 feet per annum, while white spruce can an annual growth of 100,000,000 feet in this Province. I think we may say the annual growth is 100 feet per acre, which would mean it would be greater than the estimate I have given; but if it is only 80 or 90 feet, that goes to show we are not collecting stumpage on one-half the growth of the Crown Lands of the Province. I do not know whether it is collected on all the stumpage actually cut on the Crown Lands of the Province. The lumbermen say it does. I have been hearing lumbermen from different sections of the Province, and those who do not come from the County of Northumberland state that that County is the place to start in to see that the stumpage is not all collected there, and there is already a law in that County which aims to prevent this statement and prove it is not so. I hope they will do so, because I think, in view of the needs of this Province

for educational purposes and roads and bridges, it is very important that the Government should have all the stumpage they can get out of their Crown Lands.

The statement has also been made by Mr. Gregory that the present scale for surveying timber in this Province is not a satisfactory and suitable one; that it is all right down to 11 or 12 in., but below that it is not at all satisfactory. He is right in one way and wrong in another. The scale in the Province of New Brunswick does not go below 11 inches, and whatever scale Mr. Gregory has below that I suppose is some St. John scale which they have adopted by custom and which the Government has nothing to do with whatever; but probably it would be a good idea to have the matter arranged and the Government scale adjusted down as low as six inches at least.

I haven't much to say with regard to the methods of lumbering; but I think it would be a good thing if we could have the lumber operations so conducted and looked after by the Government that the operators would take out from the woods not only the butt logs, but also the top log. It would be a great protection against fire and save what at the present time is being wasted to a very large extent. I am informed that about the only operators in the Province who are doing this and taking good care of the woods are the Bay Shore Lumber Co. That is one thing I think important and along the line of which I think there might be much improvement made. There seems to be a desire and inclination among the lumbermen and people generally to let well enough alone. They seem to think that we have conditions in this province about as good as we can have them, that we have this black spruce, which is very valuable, and that if we allow nature to do the re-seeding and re-planting, that is all that is necessary. I do not think that is the view to take. There are large tracts which have been burned over by fire and denuded of lumber, and it seems to me that the Government and foresters generally might take into consideration whether or not there might not be some system adopted by which this burnt land could be re-seeded, and be a benefit to the country. Mr. Lewis Miller, a lumber operator in Nova Scotia, has different methods of lumbering from any man in the Maritime Provinces. He has a mill which takes care of all the products of the wood, and makes it into something useful. He divides his area into tracts, and cuts down all the lumber in a certain tract and utilizes it all. Then at the present time he is bringing in seed and re-afforesting, and he is planting the Norway spruce, which he claims will grow much faster and give better results than our black spruce. There is room for thought about

restions of this kind. It is all very well to say that we have black spruce that will re-afforest itself, but improvements can be made, and I am strongly of the opinion that it would be well for this Province to look into the matter of re-afforestation.

MR. W. H. McMILLAN — You speak of taking out the top log down to five or six inches, and you say there is no scale below 11 inches. — How are we going to survey those small trees?

MR. ROBINSON — There is a conventional scale in use at the present time, or perhaps a man could make up his own scale. — At the time the Act was passed it was not contemplated to cut anything smaller than 11 inches; but conditions have changed, and the conventional scale has been in use not only in St. John, but in other parts of the Province.

PREMIER TWEEDIE — I may say the Government have this matter under consideration. We have recognised for some time that the Act would have to be amended. It is a little difficult to do; but the Surveyor-General's attention was directed to it a year ago, and among other improvements we will have a new scale prepared that will meet the requirements.

HON. J. P. BURCHILL — I would like to ask if land once burned over will reproduce spruce — if spruce trees are planted on it, will they grow?

MR. JAMES BEVERIDGE — I might say that Mr. Miller, of Nova Scotia, to whom Mr. Robinson referred, has actually planted three thousand acres of this Norway spruce.

MR. JAMES HARRIGAN — As a general thing land that has been burned over produces a different growth. We will say that where spruce and hemlock has first grown the second growth is white birch and poplar. That is my experience in travelling over the country, and in the section where I live. It might be possible that spruce could be grown by planting, but leaving it to itself it grows lumber that is not of much value at the present time.

MR. CHARLES E. FISH — My observation in that regard is that when the green forest is burned and very heavy ash left on the ground the potash is so strong that the seeds are destroyed, and do not grow. — As the potash dilutes and fertilizes the grounds the first seeds that come in, which are the

lightest seeds, such as poplar and birch, take root and grow. I have seen where green trees have been burned and the ground re-seeded, and the green trees are again growing.

MR. ELIHU STEWART— Referring to the question of reproduction, I think any person who has looked over burnt tracts will notice that, as a rule, the next growth is poplar and birch, and the reason is that these seeds are light and will fly over half a county. I have noticed everywhere in the country the first growth after a fire is poplar and birch; but if there are any seeds of the spruce or pine left, after a while they will come up and with the shade will after a time overtop the others and kill them. In the case of the pine and spruce, if there are no seed trees left planting would be necessary, and in no other way could they be reproduced. But in many cases, in the West, we see that reproduction going on. I have myself seen pine growing again where it had been swept by fires.

In Germany, even in the Black Forest, they practise two ways of reproducing— one the natural regeneration, and the other by planting. It is not all done by planting even there, although planting is advocated as being quicker and better.

THE SURVEYOR GENERAL— I would like some suggestions with regard to the scale or log rule used, outside of the scale in use in our Province, which only provides for a scale down to 11 inches.

MR. H. M. PRICE— When the Province of Quebec took up the question of a new system of log measurement I was then interested in the Montmorency Mills, and they asked us to carry out some experiments as to the difference between logs sawed into deals and logs sawed into boards, and after the experiments were carried out they took a compromise between the two measurements as a fair rule by which the lumbermen were to pay stumpage.

Mr. H. M. Price, of Quebec, Vice-President of the Canadian Forestry Association, then made the following address:

Until I arrived here I did not know I would be called upon to make any address, and, therefore, I am unprepared, but I am going to make a few remarks based on the subject now under discussion, and also on the question of pulp-wood, in which I am interested, because I have had the honor of being the president of the Pulp Wood Association of the Province of Quebec.

First of all, I would like to correct a mis-statement in the Forestry Journal, credited to the Hon. Mr. Sweeney, Surveyor-General of New Brunswick, at the Convention in Vancouver, as follows: "Hon. F. J. Sweeney, Surveyor-General of the Province of New Brunswick, said that they provided for re-afforestation on Government preserves, in his Province, by allowing the lumbermen to cut no trees less than 10 in. in diameter, three feet above the ground." I was present at the Convention, and Mr. Sweeney made no such statement. Anyone who knows Mr. Sweeney will recognise at once that that is an error, but I thought it only fair for me, having been present at the Convention, to correct this mis-statement.

I see I am down on the programme to address you on the subject of "The Lumberman's Interest in the Preservation of the Forests." In one word, the lumberman's interest in the preservation of the forest is to preserve his own interests. When he preserves the forest he simply preserves his own interests, especially if the forest is going up in value.

First of all, I am going over the Public Domain Act, passed at the last session of your Legislature. I see by the opening sentence that the Crown lands of this Province amount to about 10,000 square miles. While it is a very large area, and is your chief asset, it does not compare with the Province of Quebec, which has 67,000 square miles of timber lands under license, and besides that we have 100,000 square miles of timber lands belonging to the Crown Lands Department not under license, so that we have in the Province of Quebec a total area of about 167,000 square miles of timber lands.

I am glad to see by this Act that you are taking steps to classify your lands, and, in fact, to make an inventory of your resources. If a man wants to know how much he is worth, he should make an inventory of what he owns and put a valuation on it; and I am glad to see you are acting on those lines.

I see you are also taking steps to get a report as to the various streams of the Province, and the necessity of, and the facilities for, the storage and impounding of water, &c. I think our friends in the United States have given us a very strong lesson on that subject. It is only of late years they have found it necessary to construct reservoirs, especially as regards their water power. We in Canada up to the present time have never known what it was to have to create dams for our water powers. In the United

States many plants are run entirely by storage water, and many Americans have told me it is only a matter of time when we will have to follow their example in this respect.

I see you have also provided for a report on the location and character of lands fit for agricultural purposes. That has been a subject of very great debate in the Province of Quebec. In fact, it has been a cause of constant friction between the settler and the Government, and the lumberman is wedged in between the two, and he suffers. I think the Province of Quebec sees the necessity of separating the lands made for cultivation, and giving the lumberman the benefit of cutting on them.

You also mention here the size of the timber to be cut. In the Province of Quebec some few years ago, they recognised the necessity, in consequence of the pulp wood industry having assumed such large proportions, of allowing the lumberman to cut black spruce down to seven inches at the stump.

You have also, I see, taken measures to have proper plans and maps prepared of the Crown Lands of the Province. I might say that when in Victoria, B. C., last year, I went into the Crown Land Department there to get some information with reference to their province. They asked my name as I put it down on a sheet, and gave me every map and every book that they publish about British Columbia—about its mining resources, its timber resources, its agricultural lands, its water powers, and everything. And they will do that for anyone who sends his name. I think it would be a very good scheme for this Province to advertise itself in that way. It seems generous to give a man a great bundle of plans and books, but it is a good and cheap way of advertising, and we in Quebec are pretty liberal in that respect. I do not know your custom; but I must say I admire the manner in which British Columbia meets inquiries on these subjects.

I cannot tell you very much as to forest fires, but after I have finished speaking I would like very much to have somebody inform me what has been the result of the re-afforesting of the land swept by the fire of 1825—whether the spruce has come up again, or whether it has been practically left without a new crop of spruce.

I think the lumbermen in the Province of Quebec have in the past been too much inclined to lean on the Government, but now the Province has got a sufficient revenue not to be dependent on the Government, and it means to

my mind that all the license holders of the Province will benefit by the increased revenue, and every man will be able to look out for himself and stand on his own feet. Lumber lands have increased in value so much that you can now go to the Bank and get money on them, and we should cease to lean on the Government. In the past we have expected the Government to look after the protection of our limits against fire, but last year the Government said: "You look after the protection yourselves." We will charge you no fees. You nominate certain wardens, and we will have supervision over it. You are able to look after this yourselves, and you rest about it. I am glad the Province of Quebec did this, because it put a responsibility upon the lumbermen, and showed them they could not look to the Provincial Government for everything.

HON. MR. TWEEDIE—In Quebec are the lumbermen required to protect their lands from fire, without any assistance from the Government?

MR. PRICE—Yes.

MR. HAZEN—Previous to that arrangement, had the Government made some charge against the lumbermen?

MR. PRICE—Yes; they made a small charge against the licensee.

MR. HAZEN—And now they remit that charge?

MR. PRICE—Yes; and they say: "You do it yourselves and we will have a supervision over it." The lease is an annual lease, renewable as long as the ground rent is paid and the provisions of the law carried out.

MR. F. W. SUMNER—You spoke about leaning on the Government. If you would state the difference between the terms of the Quebec leases and the New Brunswick leases we would understand it better.

MR. PRICE—Our leases are always put up to auction. Of late years it has been an annual sale; but in consequence of the subsidies to be received from the Federal Government they have given up the idea of any sale in the immediate future. In fact, they have stated there will be no sale this year, and I think it very possible there may not be a sale for some time. We pay a ground rent of \$3,000 per square mile per annum, and a stampage of sixty-five cents per thousand feet on spruce.

A DELEGATE—Here in New Brunswick we are at the mercy of the Government. It is not to our interest to protect the land and make it more valuable for the Government, who are apt to take it from us any year by raising the millage and stumpage, if this Act comes in force that they are talking about. We have no guarantee at all.

HON. MR. TWEEDIE—But you can throw it up any time you like.

DELEGATE—Yes; but all the work we put on it will be of no value if they put up the price so high we cannot carry it.

MR. PRICE—My experience in Fredericton has taught me that the Government of this Province has tempered justice with mercy in dealing with the lumbermen. In our Province we get justice alone; we get no mercy.

On the subject of pulp-wood, and the export duty thereon, I wish to say that I am strongly against any export duty from Canada. Perhaps my remarks will not carry the same interest here as they would up in Quebec, because up there so many of our farmers are dependent on the exportation of pulp-wood in order to pay their way. In fact, I may say that ten years ago a great many of the farmers and habitants of the Province of Quebec were always indebted to the store-keeper; but since pulp-wood has become such an article of commerce they have paid off what they owed the store-keeper, and the store-keeper has also got into a good position, and there are fewer failures in that Province in consequence. Every tree that the farmer has on his land is valuable, if not as a saw log, then as pulp-wood. When you speak of ten thousand miles under license, it seems small compared with our 167,000 miles; but when you consider what that area means, and that it reproduces itself so rapidly, I am perfectly satisfied there is no immediate danger of a famine in wood. Now what would an export duty on pulp-wood mean? It would mean that every man who had lands or limits would have them depreciated in value, because he cannot sell his pulp-wood except to the paper mills, and they could not buy it because the duty would be so heavy it would be prohibitory. Supposing we export one million cords of pulp-wood per annum to the United States, it is a drop in the bucket compared with the amount of wood we can allow to have cut yearly from our 167,000 miles in the Province of Quebec; and, therefore, I say it is not in the interest of the licensee or the farmer that we should have this export duty put on. They say that if we adopted this policy, that in the course of

four or five years the Americans would be forced to come over to this side and build their mills; but in four or five years a great many of the people would be starved out, as it would mean in a great many cases going four or five years without eating. It is not as if our resources were small; but when we consider the large amount of wood we have we need have no fear. From what I hear from Ottawa I understand that the Government there are not in favor of an export duty, but that the interests of the majority in Canada will prevail in this question, and not the interests of the minority.

I was very much interested in the talk given by Mr. Kidner yesterday, and I think the true way to get people to take an interest in forestry is by educating the younger generation along that line, and I am very glad to come down to New Brunswick and see you have commenced at the right end; that is, with the boys in the school.

I congratulate the Premier, and his Cabinet, and my friend, the Hon. Mr. Sweeney, on the great success attending this Convention. I can assure you Mr. Sweeney has taken a deep interest in the different Forestry Conventions which have been held throughout the Dominion, and has done your Province much good. In the Convention held at Vancouver he brought your Province well to the front by his remarks, not only from a forestry point of view, but from many other points of view. It is a good thing for representatives from the different Provinces to meet at these Conventions. We are all one and our interests are the same. In this respect I would like to say that in going over the Pacific Mills, in British Columbia, the President said to me that they were the largest owners of timber limits in that Province; that they were very glad to have us come out to the Coast, and give them our ideas, and that, as a result of the Convention, their Company was going through their books, and was going to put a new value on all their timber possession in the Province of British Columbia, and he further stated that the Convention had opened their eyes and the eyes of the Government, and that it was the first time they had been able to get the Government to take any interest in the matter. It was shown at the Convention that the Government only spent \$5,000 a year for the protection of the forests, when there were hundreds of millions of dollars' worth of property at stake; but this gentleman said he felt sure the Government would take up the question at once, and spend a considerable sum of money to protect the vast assets they own in their timber limits, and I hope this Forestry Convention in New Brunswick will have the same effect, and that this Convention is only the first of many similar ones.

Mr. Power, M. P., of Quebec (West), made the following address:

It is certainly a pleasure to me today to have the honor of sitting at this important meeting; but, Mr. Premier, you take the pleasure from me when you call me to my feet, because I really came here to study. I feel somewhat in the position of the gentleman who was walking down a fashionable thoroughfare, and was attracted by a small boy attempting to ring a doorbell about the height of his boy. The gentleman kindly offered to assist the boy, and ring the bell for him, when the boy turned around, and in his own sweet tone said: "Thank you, son of a gun."

That is how I feel, and the only thing that deters me from running is that I am a native born Canadian, and Canadians never run, but endeavor to do their duty to the best of their ability.

Mr. Price has touched on everything that appertains to forestry, so far as the Province of Quebec is concerned. I am here to do a certain amount of duty and to give you a certain amount of information, which I shall be most happy to do.

It has been my lot to have practically spent a half-a-century in the lumber business, and to have travelled from one end of the Dominion to the other, and outside of this Dominion, and I have seen a great deal of what is going on, and especially one feature, to which I will refer, and it has important bearings on the commerce which we have today, and that is the destruction of the most valuable forests which are for the benefit of mankind.

It was my lot when but a boy, in 1866, to have left my native province and to have crossed the American territory into that great Pine State of Michigan, when it was practically a forest, from the City of Saginaw to the Straits of Mackinac, and where is it today? In later years I crossed the Straits of Mackinac and on to the bounds of Michigan, and here there was nothing but the tracks of the Indians and the lumberman's trade, and there I had looked upon forests which it appeared a century's work would not cut away, but today it is done.

In later years I crossed into the pine regions of Wisconsin and Minnesota. Today there is nothing left in that section of the country but hack pine and Norway. To come back to my own country, and to the destruction of the pine in our own province. Many a time have I

looked back to the books of reports and have seen the records of the thousands and thousands of feet of valuable pine which have been shipped out of the district wherein we now stand. Following on from my own native district along the valleys of the Saguenay, and up through the St. Maurice, to-day it is practically gone, and there is nothing left in this valuable section for the benefit of mankind but a small portion. And is there not food for reflection in this ?

Statisticians come before us and tell us of the inexhaustible forests of the Dominion of Canada. As a politician, which I am slightly, I have sometimes faith in statistics when they suit a particular purpose, but as a practical lumberman I have but little faith in them, and it is your duty, and I am proud to see the interest your Government and legislators are taking in this important business, that is, in the preservation of the next most valuable — for the benefit of mankind in general — your valuable trees, of which you in the Province of New Brunswick and we in the Province of Quebec hold the largest portion today. Resources such as these are the only means to protect you and protect this Canada of ours.

First, we must look for a means to protect ourselves from that terrible enemy of fire. How this is to be done is left in your hands. It is solely in the hands of the lumberman, as far as the Province of Quebec is concerned, as Mr. Price has said. I may be a little ahead of my time when I would suggest to the lumberman, not only in the Province of Quebec, that some system may be devised whereby we can escape from the ravages of fire which cause such heavy destruction to the forests, and I will put my idea before you today ; that is, if it were possible to have protection by a system of Marconi signals on the mountain ranges at the main points of the country. These forest fires are certainly something that deserve the attention of every lumberman.

Secondly comes the question of our great waterways, for this is very important, and we in the Province of Quebec have seen important changes in the different waterways of our country. Not only in the interests of lumbermen and farmers, but in the interests of trade and commerce, it is our duty to protect the great water powers given to this country of Canada. A great writer, of Boston, not long ago said that the water powers of Canada would make even the great industrial powers of Carnegie at Pittsburg shake with fear, and we certainly should do all in our power to protect those water powers.

I thank you and I wish this association you have formed every success, for it is one that is beneficial, not only to the province, but beneficial to the country in general.

Mr. J. D. Hazen submitted a report of his Committee:

Your Committee appointed at the meeting of the Forestry Convention held yesterday to report certain recommendations to the Convention beg leave to submit the following report:

That in the short time at their disposal they have given such consideration as they could to the important matters submitted to them, and beg leave to make the following recommendations:

1. That in order to make as attractive as possible and to beautify the cities, towns and villages throughout the Province, the Civic and Municipal authorities in New Brunswick be strongly urged to adopt a systematic policy of planting ornamental trees.

2. That in order to render attractive the different roads throughout the Province legislation be passed for the encouragement of persons in setting out ornamental shade trees along the highway roads throughout New Brunswick, and in this connection your Committee call attention to the laws in force in the Province of Ontario, whereby they understand that a bonus of a small amount is given for each tree set out along the highway road in the Province according to the directions given by the Public Works Department, or by some other plan.

3. That the movement of planting trees on school grounds which has been in force for many years, but has produced but few results be strongly sanctioned by this Forestry Convention as a means calculated to secure the interest of the people.

4. That your Committee, realizing the enormous injury that in the past has been caused by forest fires resulting from the construction and operation of railways in the Province, strongly recommend that effective laws be passed for the purpose of preventing in the future a repetition of such losses and that such legislation should include adequate protection against carelessness during the work of the construction of railways, and that there should be a provision that when roads are in operation during the dry season between the first of May and the first of November in each

your section men on all railways should be required to patrol the road at least twice a day and that railway companies be compelled to issue special instructions to all section men and employees to do all they can to guard against grass or forest fires and to promptly report any which may occur. And they further recommend that the Department of Railways and Canals of Canada and the Canadian Pacific Railway Company be strongly urged by this convention to take necessary and effective means to prevent forest and grass fires being caused by the operation of their respective railway.

5. That one or more officials be appointed with the title of "Inspector of Sealers," whose duty it shall be during the lumbering season to visit the different camps and lumber operations throughout the Province for the purpose of seeing that the sealers are faithfully carrying out their duties and are taking proper account of the amount of lumber that is cut and that undersized lumber is not being cut and that the laws with regard to the cutting on Crown Lands are being strictly enforced, and it shall be the further duty of such inspectors to carefully observe the methods of cutting carried on by different lumbermen and to report to the Crown Land Office if, in their opinion, wasteful methods in cutting are being used by any of the operators.

6. Your Committee further recommend in this connection that the inspectors discharge their duties, so far as the times of visiting the operations are concerned, along the lines adopted by inspectors of banks, so that sealers and the persons whose lumbering operations they are to inspect will have no means of knowing beforehand the date or dates at which the Inspectors will make their inspection.

7. Your Committee further urge upon the Lieutenant-Governor-in-Council the desirability of carrying out the law already upon the Statute Book authorizing the setting apart of a portion of the public domain for a forest reservation.

(Signed) A. E. McCLELLAN,
Chairman.

THE ATTORNEY GENERAL.— While this makes proper mention of the protection of lands along the railroads it does not appear to go far enough, because it would not be effective if simply passed in its present form.

The report recommends that the Provincial Legislature of New Brunswick enforce regulations against setting fires along the railways. In this province, the greater part of railway lines belongs to the Intercolonial Railway and the Canadian Pacific Railway, but the Intercolonial Railway being at present at work, with regard to the operation of it, neither this Government nor Legislature could interfere, and the Canadian Pacific Railway is also a company line operated by the Canadian Parliament, and neither this Legislature nor the Government could have any power to pass a law, or enforce regulations, which would in any way interfere with the operation of that line or railway. Taking out these two great lines, all that are left are the two branch roads, including the Grand Southern, occupying a comparatively small range in the Province of New Brunswick. I would respectfully submit whether or it would not be better to add some words to the report which would contain a recommendation from this large and representative gathering to the Dominion Government and Parliament, that they also, in connection with the roads under their control, should take effective measures along the lines suggested in the report, in regard to the means to be taken to keep fires from starting and spreading along the lines of those railways. We know that enormous and incalculable damage has been done in the past by the operations of those lines, and it seems to me now is the time to make a recommendation which might be embodied in the report.

THE SURVEYOR GENERAL. — I would like to say that for the last year or two, at least the Manager of the Intercolonial Railway has afforded every facility to those interested in our forest fires, not only giving permits to ride on their trains where necessary to put out fires, but every spring, during the commencement of the dry season, instructing the section men and bosses of the sections, as well as drivers and conductors on the road, to be on the look-out for forest fires. I think in that respect the matter was taken up between the Manager of the Intercolonial Railway and myself within two years, and, since that time, I think the practice has prevailed. This is also true in regard to the Canadian Pacific Railway, and in that respect the resolution has been anticipated somewhat. The Canadian Pacific Railway has been also somewhat careful, and afforded every facility. Mr. Berry, a sealer in the southern side of the province, could testify that Mr. Downie has afforded every assistance in arresting, and putting out, forest fires in existence, besides instructing the employees to be on the look-out for them.

MR. GEORGE F. HILL. — I am somewhat responsible for that

action—and would say, in answer to the statement made by the Surveyor General, that the Intercolonial Railway looks after the fires in good shape, and also the Canadian Pacific Railway. Then if these roads are not guilty of negligence, they will not come under the operation of the action, supposing it was put into law. My experience of the Shore Line is this—the Canadian Pacific Railway and the N. B. Southern run through a farm of mine—the N. B. Southern through three-quarters of a mile of wooded land. The Canadian Pacific has only burned us twice—once burning our fields, and another time burning our farm over, and cutting the wire fences; but those were grass fires, in both cases; but the N. B. Southern road, in addition to the danger from sparks, the engines are old, their ash-pans are all out of order, and Mr. McLean acknowledges himself that they do not keep the ashes, but distribute them along the road. Well, they get on a partially decayed sleeper, which is not unknown on that line, and the sparks go to the side of the road; they never cut last year's or any other year's grass, do not cut out any refuse they make from replacing sleepers, and so everything is ignitable, and year after year I have to engage men to fight the fires of that road.

I notice the C. P. R., and, as far as I know, the I. C. R., do things better. They keep cleared up and cut out the distance required, 400 rods or whatever it is. You see this diligently, that you cannot prove that the railways caused the fire, and that they were not caused by someone with a cigarette. I feel that something ought to be done to prevent these fires. Last year was a favorable one to the owners of property. We only had to put out one small fire, when usually we have to fight quite a few during the season.

Now we go down and cut and burn for ourselves, but I do not think we ought to be put to that expense, and when our fences are burned it is pretty difficult to get the N. B. Southern to rebuild a fence.

I think there is nothing in that report that will do any harm to the Intercolonial and Canadian Pacific Railways, but it will only reach the branch roads. The N. B. Southern is not the only branch road, but a few others are operating in the same way that it is.

A STRANGER—I came here to listen, but I might just say that I live in a spot where we frequently have fires, and although it is generally said that the Intercolonial Railway looks after their share of the fire, yet two years ago my sons and I put out two fires which would have been danger-

ous if we had not been near to see and prevent them from spreading. It would seem to me that the Government ought to appoint about two fire wardens in each parish for two or three months of the year, whose duty it would be to look sharply after those fires and thus probably save much valuable forest to the province.

MR. J. D. HAZEN— I am sorry the Chairman of the Committee is not here today, but I think Mr. Hill has explained the purpose which the committee had in view. They wanted, if possible to guard against two things: first, the danger of the forest catching fire while the railway construction was going on.

I pointed out to the committee that action along that line had been taken by this legislature in regard to the construction of the Grand Trunk Pacific Railway, and an agreement reached with the builders in the construction of that road by the Government of this province regarding providing ample protection to the country during the construction.

Then there is another large line of railway to be constructed across the northern end of this province. First we should have in mind that laws should be enacted and means taken to protect the forests from destruction from fires while the railroads are being constructed, and in the second place prevent the destruction of the forests by the operation of the railroad after constructed and running.

I certainly think it would add very much to the force of the resolution if the idea of the Attorney General was added to it, that is, that this convention should make a strong recommendation both to the Dominion Government and to the Canadian Pacific Railway Company in favor of their taking all necessary steps to protect the country through which they run from fire caused by the operation of the railroads; and while I have not time to consult with the other members of the committee, I think I would take it upon myself to say I would accept the suggestion made, and if the report is adopted that an addition is made to it in that respect.

MR. KILBIBEN— I would say that I know the fires are doing the greatest damage in connection with the Intercolonial Railway and are hardest to fight. They take great precaution to fight them but it gets beyond their control and then they do not fight it with any force.

MR. F. W. SUMNER— I think the root of the trouble in regard to the

railway is in the smokestack screen. In the heavy grades that obtain on the Intercolonial Railway, and I believe on the Canadian Pacific Railway as well, long trains heavily loaded, the engines naturally send out large cinders, and as I understand it—although my information is secured secondhand, but I think authentic, from the Speaker of the House, that he read an article not long ago saying that no railway in Canada today had the correct smokestack fire screen, except the Lake St. John Railway. They had made a study of it and today had practically a screen that would keep the sparks in.

These fires along the line of the railway are usually caused by the sparks that come through the screen. In a great many cases the locomotives go out of the machine shops, or roundhouse, with the screen broken, they get broken and in the rush and hurry they often send a locomotive out with a tear or break, and of course that engine making the trip that day through a wooded country starts a great many fires. In fact I took the trouble myself when I had some lumber burned one year and went to Campbellton and found out that the screen in the smokestack was out of order and had been out of order for a fortnight; but still I could not prove it, although I got it from the engineer himself. When I went to the roundhouse the foreman and all hands made a statement it was in order and in the meantime they put it in order. I believe that is the main cause of the fires.

Again, in reference to the report, there is a subject which may be delicate for me to touch upon, as I am interested in lumber. It seems to me that the committee—I do not wish to criticize them, but they have considerable courage to bring a report of that kind before a convention of lumbermen and ask them to vote and adopt it. They reflect first, I think, on the Government, on the scalers second, and on the lumbermen third, and in very concise and specific manner. Of course I am willing to be with the crowd and if they want to make it unanimous I will be glad to do so, but I think the lumbermen ought to get a report on the committee and see if they will pass ours.

MR. STEWART—With reference to the fire screen referred to by the speaker: Within the last month or two the drawings of a certain fire screen have been sent to me and the device has been used on the St. John Railway during the past season and is endorsed by the engineers, and I believe also by one of the officers of the Comté of Quebec who strongly recommends it, and from the appearance of the drawings I think it is the best. It certainly has the best showing on the face of it—the best device I have seen brought out.

I sent it over to Mr. Butler, Chief Engineer of the Intercolonial Railway, and his opinion was in accordance with mine. The difficulty heretofore has been that the tie screens interfere with the draughts. This one has a device that seems to overcome that and I have very great hopes it will be found successful. I just mention this as something that has lately come under notice and I think is worthy of being tried. It has been already tried on some railways.

Resolution passed unanimously by the Convention

MR. CHARLES E. FISH, Newcastle, N. B. — I have listened with great pleasure and profit to the proceedings thus far and very much ground has been covered and there is little left that I can say that will be new and of interest to you, so that I think I would be resourceful indeed if I could say anything that has not already been better said.

However, as I am somewhat attached to this industry and very much interested in it I will express to you in as few words as possible matters that have come to my attention in my daily work.

What I am about to say is purely from a home standpoint of conditions as I have observed them in my daily rounds, and perhaps observations in the beautiful forests are as good a teacher as one could have. No doubt it has occurred to most of you here, as it has to myself, that the time has now come when all that we understand as the backwoods and the bush is to be elevated to a science as Forestry. It is not a danger or in any way antagonistic to the best interests of lumbermen. Its theories are old and have been in practice for hundreds of years in the old countries, giving satisfactory and continuous yearly results. It is so closely allied to the great industry of our country that the wonder is we have not given it more attention heretofore.

A great deal has been said here of the wealth of our forests and our attention has been drawn to it very clearly, to such an extent that it is unnecessary for me to speak of it at any great length. It is said we annually receive about twenty-five per cent. of our provincial revenue from our Crown lands, and if we add to this what the people receive from the same source it makes a pretty good proposition from the business standpoint and shows pretty clearly any effort we can put forth towards the preservation of our forests is indeed a duty which we owe to the present and to the future welfare of our country.

Apart from the wealth it is to our country there is the great value of the trees in bringing the rains to the dry streams. Then from the aesthetic standpoint, the beauties of the forests and the beauties of nature as we read them; all these and many other considerations which might be gone into show clearly how necessary it is for us to begin now and in earnest the subject of Forestry, of which I hope this convention is the initiative.

Our forest areas are gradually growing stronger and it would appear we are not getting a proportionate increase in population or acreage under cultivation. The value of the lumber we are getting from our forests is increasing and has increased rapidly during the past few years. This is no doubt due to increased demand and also largely to forest areas elsewhere being rapidly depleted. Countries once our greatest competitors are today among our best customers. We have in our forests a great heritage and when we reflect on what nature unaided has done for us and how prodigate we have been of her bounty it becomes clear the time for prompt action is now upon us.

The subject which I wish to speak of particularly today is entitled: "The prevention of Forest Fires." The circle of our forest area is rapidly becoming smaller, and as I stated a few moments ago, any effort we can put forth should be put forth now. The cause of forest fires, or the source from which they arise, is chiefly attributable to the carelessness of hundreds of sportsmen and cruisers, lumbermen and settlers in clearing land, berry pickers, fires from locomotives and sometimes they are attributable to lightning.

Those which are caused through human agency as well as by locomotives we should be able to control. I do not think that we are very liable to fires from lightning in our section of the country. It is generally accompanied by very heavy rain, and though we very frequently see deciduous trees in the forests, which have been struck by lightning, yet we do not count there is half as much danger from them as they do in the west.

To fight a forest fire is indeed a task and those who have engaged in it will tell you how little can be done. We have seen a large force of men armed with everything with which to fight a fire, armed with buckets, shovels, axes, with axe and pickaxe, and aided by horses and plows, unable to check its progress. So long as there is any dry moss, leaves, undergrowth, or any kind of combustible foliage to burn or feed it, it will run, blaze, roar and burn until

it burns itself out or through the intervention of a favorable wind or protracted rain it is extinguished.

Such being the case, it is quite clear that our action lies in taking steps beforehand. While we may not be able to prevent every fire, we can at least prevent the repetition of the cause of many past fires.

It might be that an efficient fire force could be formed—an efficient force of fire rangers for service in the dry season. This force should be mounted and along the lines of railway supplied with velocipedes. They should keep posted in conspicuous places copies of our Forest Laws; they should issue passports to parties going into the woods in the dry months; they should report frequently to their chiefs, hold a rigid investigation into the cause of all fires and report them to the Government. They should be active, alert and constantly on duty to detect any outbreak and check it at the start. They should be familiar with their district, knowing all the roads leading from their settlements, the trails and streams, and be able to keep in touch with all parties going to and returning from the forests.

There might be lookout towers erected on elevations commanding an extensive view of the surrounding timber areas. They could be so placed as to keep the whole timber area under the eyes of the lookouts during the most dangerous months in the season. They could be cheaply erected, and our country is especially adapted to it, affording suitable sites for the erection of these towers.

The clearing away of old works and removal of tops of trees and boughs is another important matter, but it might be expensive and probably difficult to enforce. However, as we grow and go on I predict that in time we will see that even this will be done in our forests. The expense of this might very reasonably be borne, or divided between the government and the lumbermen and the railways.

I have just briefly referred to the wealth of our country in forests, and to the cause of the very great destruction therein, and also suggested something that might be the means of preventing their destruction through fire. A great deal more might be said, but it would be only recalling to your minds what you have already heard. There are many questions I might touch upon that are more local in character and some in dispute between different parties interested in the industry, but all these no doubt when our convention meets and talks the matter over again will be settled and adjusted, so

that in future we will be able to go on and discuss the matter more intelligently and deal with it more successfully than has been done, and leave behind a legacy to posterity which will be to them not a burden or debt, but flourishing, beautiful forests abounding in wealth.

Mr. James Beveridge of Chatham, then read the following paper:

THE DEPENDENCE OF BUSINESS INTERESTS ON THE FOREST.

New Brunswick consists so largely of non-agricultural land, that the business interests of the Province shall always be more or less, bound up with, and dependent upon, the products of the forests. Although agriculture flourishes in certain districts where it can take advantage of the rich alluvial deposits chiefly found in the valleys and low lying lands, yet, taken as a whole, it cannot be compared in this respect with the prairie lands of the West, and one might with perfect truth say that, what wheat growing is to the West, so may tree growing become to us here in the East. We possess a climate admirably adapted for the cultivation of trees, and our natural position together with natural advantages which the province itself offers for the pursuit of those industries that yield manufactured products for which the forest supplies the raw materials, must be manifest to the most casual observer. We possess three large rivers, namely, the Restigouche, Miramichi and St. John, which, with their tributaries, form a perfect labyrinth of water ways intersecting the whole country and enabling the lumber of the forests to be easily transported to seaboard, near which lie most of the important business centres.

The industries that depend on the forest for their existence may be divided into two great classes, namely: First, those employing the mechanic arts; and second, those that may more strictly be described as chemical industries for the successful conduct of which, applied chemistry as well as engineering, is necessary. Under the first class I include single log sawing and all its accessories, and those other manufactures using machinery alone to produce their finished products, such as ground wood pulp, furniture, either wholly or in part, window frame, door, shingle and such like manufactures; whilst under the second class, I would name, all products obtained from the dry distillation of wood, such as wood tar, acetic acid, charcoal, the produc-

tion of wood alcohol, oxalic acid, various extracts from bark, and so called chemical wood fibre for paper making, all of which as above said, involve a knowledge of applied chemistry for their successful pursuit.

Of these two classes of manufactures the simple sawing of deals, boards, shingles and laths in our different saw mills, and the manufacture of chemical fibre in our pulp factories, easily rank as the first or most important. We possess in New Brunswick many important tanning extract factories but I do not think there is yet established in our midst any factory for the production of wood alcohol and other of the chemical products above mentioned. And it seems strange that this is so, for the so-called waste of our saw mills might be utilised in a great variety of ways for the production of such like products, or indeed for the manufacture of paper pulp or of paper itself, forming a valuable asset of the State. So far as I am aware there is only one manufacturer in this province who has successfully attempted the utilisation of saw mill waste by converting it into a variety of paper or paper board which I understand finds a ready sale as a sheathing and for other purposes. Kindred methods of utilising such waste have been in vogue for many years in Europe, the products of whose factories rank high in quality and yield excellent profits to the manufacturer.

To give an idea of the enormous waste going on in our mills I have computed the following: For every thousand superficial feet cut it has been stated in evidence that the edgings obtained measure when piled from 9/10ths to one cord of 128 cubic feet. I am however disposed to consider the actual amount obtained in ordinary practice, after deducting laths, pickets, barrel heads and staves, etc., cut from the slabs to be more nearly 2/3rds of a cord. The estimated cut of deals in New Brunswick alone I set down as 350 millions so that 2/3rds of 350,000 or 233,333 cords of waste edgings are produced annually. As two cords of such waste when properly treated will yield by any of the well known chemical processes, one ton of chemical wood fibre, and one ton of such fibre will yield one ton of paper, this waste wood if converted into paper would therefore yield 116,666 tons whose value taken at 75 dollars per ton would be equivalent to a total value of over 8 1/2 millions of dollars. I am well aware that a portion of this waste wood is sold locally for fuel and probably the whole 2/3rds of a cord per thousand cut is not available for conversion into useful trade products. But the above is a measure of the possibilities for utilising this waste wood and it is a significant fact that the trade value of the product produced from such waste, is far in excess of the actual value of the deals and other accessory

products in the manufacture of which the waste is obtained. I have touched somewhat lightly on this subject to point out the obvious opportunities there are for our manufacturers to turn their attention to the utilisation of their waste, a scheme for which, would not only enrich themselves but the state as well.

In order to make a comparison of the relative values of the saw mills and chemical pulp factories and their products I have made the following estimates which I offer as being only substantially true. Of saw mills I include those of an established or permanent character and exclude those mills called "portables." The total lumber including deals and other products cut in 1906 in such mills in New Brunswick, nearly approached 450 millions, board measure, the mills having an estimated aggregate capital in plant and machinery of \$2,250,000. The total estimated value of their products may be set down at \$6,750,000, whilst they paid to the State in wages a sum nearly equal to \$3,150,000.

On the other hand the total invested capital in plant and machinery of the four sulphite mills in the Province aggregates \$1,850,000, they produce 43,000 tons of fibre per year of the value of \$1,400,000 at the factory; consume 47 million feet of log; 67,000 tons of coal, which they draw from the neighbouring Province of Nova Scotia, and pay \$516,000 nearly in wages annually to the State. On comparing these figures it will readily be seen that in point of importance to the community or State, the production of chemical fibre easily takes a first place. This indeed, can be more readily demonstrated if the comparison be made on a stricter basis. Taking 1,000 superficial feet of logs board measure brought out of the forest, as the basis of comparison, we get the following:

Relative value, etc., of saw mills and pulp factories. Basis of comparison 1,000 superficial feet lumber used.

	Saw Mill	Sulphite Fibre Factory
Wages,	\$ 7.00	\$12.00
Value of product at factory,	15.00	31.50
Capital invested in plant, machinery, etc.,	5.00	41.00

That is to say, pulp mills pay 5 12ths more wages to the State produce a product twice the value, and have an invested capital 8 times greater than saw mills, for every 1,000 superficial feet of logs which they respectively use.

No one will deny that where capital is invested in expensive plant and machinery it adds stability to the community or neighbourhood in which it is placed; and also that the importance of an industry to a State or commonwealth depends upon the amount of money which that industry pays for wages or to the wage earning class.

These comparisons are not made for any invidious purpose but simply to point out the importance of the sulphite fibre industry to this Province, and as plea to the Government to support and foster that industry by granting the pulp companies every facility, not only to conduct their business without reasonable let or hindrance, but also to grant to them certain privileges in respect to forest lands which will enable them to consolidate themselves and become established factors in the country. Pulp factories are so costly that no one can embark in the business nowadays without having behind him some guarantee that the supply of raw material in the form of pulpwood will be forthcoming for a long period of years, in uniform quantity and uniform in price, outside the ordinary fluctuations of the labor market.

The same holds true of the lumber sawing industry, for, notwithstanding their vested interest in plant and machinery is less than that of pulp and paper mills per thousand superficial feet of lumber they consume, they manufacture a much needed product and one in constant demand, and if in so doing they have hitherto neglected to utilise to the full their waste material, the future lies open to them to amend their ways and so become more useful citizens of the State.

For many years there has been an outcry against pulp mills wherever they have been established in countries possessing large forests, chiefly on the score of cutting small trees. No doubt this outcry was justifiable in certain cases but in the vast majority it was unwarranted. The illegal cutting of small wood by any one should be stopped, be they owners of pulp mills, saw mills or portable sawmills. The portable rotary is a great sinner. It usually leaves behind it, wherever operated, evidences of flagrant waste. In the same sized lumber usually handled by these mills were passed over to the pulp or paper maker every particle of the log would be utilised with all the aforementioned advantages to the State, viz., more wages paid per thousand feet cut and higher value of product produced.

As a matter of fact my experience which extends over the greater part of Northern Europe (Russia, Finland, Norway and Sweden) as well as Canada

and Newfoundland, has confirmed a belief long held, that it does not pay pulp mills to use too small lumber but only that of medium size. The average diameter I would set down at 9 inches in the middle as the most suitable to which no exception should be taken on the ground that the whole tree is used down to five or six inches at the small end. In Norway and Sweden where the forest laws are stricter and better maintained than in this country, the establishment of pulp and paper mills of every class has been fostered and encouraged, for their operation has proved of great benefit to the State.

Industries, such as pulp and paper making and lumber sawing, cannot become permanent in a country unless due regard is paid to the source of raw material upon which their existence depends, namely, the forest. It is well known that forest lands near our saw mills do not now yield as large sized logs as formerly, or in other words, they have been depleted and a second growth has arisen consisting of smaller trees and what I will call for want of a better term "weeds." By weeds I mean the broad-leaved trees in contradistinction to the conifers or the pine family. This so called "second growth" is said not to yield such good lumber as the growth immediately preceding it, and I believe this to be true, for the simple reason that no attempt is made by the owner of these lands to give a chance for the best trees to grow by freeing the forest from weeds. Again, the growth is frequently so thick, that unless thinning is resorted to, it is impossible to obtain saw logs under a very long period of years. Until in fact the stronger survive their weaker brethren. To allow nature to go on unaided in this fashion in demonstrating that well known law—"the survival of the fittest"—is, to say the least, impeditic, and the only remedy is to allow the process of thinning to take place judiciously, under, if found necessary or expedient, Government supervision, so that the forests may ultimately become "a boon and a blessing to mankind." Now the depletion of such lands of saw logs and subsequent permission for the growth of weeds has not been the work of the pulp or paper maker, and as what is obtained in the process of thinning is unsuitable in point of size for sawing on account of the waste which this operation entails, is it unreasonable to request that that lumber be handed over to the pulp and paper maker for conversion into useful products? Mr. E. Hutchinson of the Miramichi, than whom there is no abler lumberman or closer observer of all departments of his business in the Province, informs me that from a long series of observations he has concluded that it takes about 100 years to grow a saw log of the 18 by 10 limit and that 70 years is the period of growth of a medium sized spruce tree, under, I presume, the conditions of growth which at present prevail in the Mira-

nichi district. These conditions, varying somewhat in different districts, according to soil and climatic influences, are generally not favorable to the rapid growth of lumber, mainly because of the too close proximity of neighbouring trees, and thus the yield of good sized merchantable lumber from such forest lands is low. Under proper cultivation and given average quality land in respect to soil, etc., I believe that our native black spruce can be grown of equal size to that referred to by Mr. Hutchinson in a much less period, say for 18x10 logs, 80 to 90 years, and for medium sized logs for pulp manufacture, in from 40 to 45 years, and I base this belief on results obtained elsewhere, particularly in Germany and Scandinavia. As you all know in Germany the cultivation of trees has become a science. No one can pass through the Baltic provinces of that country without making that observation for himself. He will there find the forests, if one might so use the term towards comparatively small areas of woodland, regularly planted and carefully tended. But the mode of culture in that part of the world would not be suitable, or is not necessary for us here. We already own vast tracts of forest lands which only require a fair amount of attention and the application of a little common sense in their treatment to convert them in course of time into very valuable assets of the State. The ordinary New Brunswick farmer who owns a wood lot of say 100 acres or more, if, instead of devoting part of his time to outside pursuits, paid proper heed to his forest trees, might in a short time become possessed of considerable wealth, for it is quite possible to grow at least 100 cords of spruce pulp wood on one acre of such land within a generation, provided the woods are kept under and only the valuable timber allowed to grow.

In Germany under cultivation over 3,000 trees regularly spaced can be grown per acre up to 25 years of age, the forest is then gradually thinned the thinnings being suitable for pulp and paper making or other purposes where small timber is needed. Usually 10 per cent or 300 trees are left standing for growth into large size, which growth covers a period of from 80 to 90 years.

Perhaps I am the only one at this convention who has had experience in Scandinavia as well as in our own province in the treatment of forests and a description of the practice of forestry as carried out in that part of Sweden where I had control of 40 square miles connected with a large pulp factory, may be interesting and perhaps instructive. There was no attempt at growing either from seed or young sapling, but each tree intended to be cut, was carefully selected, measured and marked (by blazing). The marked

trees were then counted and the felling and trimming let out by contract at so much per tree. The outer bark was then taken off with the axe, also by contract, and the peeled logs hauled direct from the stump to the stream, where the process of driving (or floating as it is called) there was carried out much in the same way as here. The average size of lumber used in that particular mill would be when peeled 8 inches. In the case of lumber for saw mills the logs were of larger size and were not peeled. The work of getting these saw logs was carried out by contract at so much per stick.

The forest was kept clean by felling all woods, gathering up all wind falls and tree tops unsuitable for pulp, and burning and floating these to the factory for fuel wood, such timber remaining unburned. In one season alone I took delivery of 25,000 cords (roughly) of fuel wood thus obtained and 20,000 cords of pulp wood. Of course such practice can only be carried out in association with a factory using large quantities of fuel and where labor is cheap to enable the fuel wood to compete with coal. There is no reason why such a system of clearing the forests for the better growth of trees should not be carried on here under similar conditions.

It seems to me that the treatment of our forests should be carried out on a broad common sense basis. A system of keeping the woods under, removal of debris, and thinning out to let the stronger and healthier trees grow should be adopted and that such a system should be carried out on well defined and comparatively small areas, either by the Government or private ownership (license holders). Assuming that spruce (or any other timber) in accordance with the prevailing conditions, were required, the number of trees per acre might be regulated by law within certain ascertained limits. In this way the growth of trees of large size would be promoted and the sawing industry preserved in those districts where today it is difficult to find the necessary supply of logs of proper size. Meanwhile, there is ample outlet for the smaller timber in our pulp mills, and the whole system might be under efficient government control. Mr. Tweedie's bill of last year's certainly a step in the right direction and is marked by a broad common sense view of the whole question, treated on business lines. Personally, I hope that that bill will be realized in practice although obvious that it involves the expenditure of large sums of money in its operation. It is a comparatively easy matter to legislate but quite another matter to carry that legislation into effect in a small community. The bill itself does not perhaps go far enough, still, it is a great step in advance towards a better state of things. The question of longer leases I must leave to able members of this conven-

tion than myself. Perhaps the Government, in its wisdom, may ere long see the advantage of granting some further concessions along this line, in order to increase the present license-holders' interest in preserving by judiciously nursing the forests under their control.

Finally, in this brief and very imperfect paper, I have tried to rapidly distinguish the two great industries depending upon the forests for their existence; have given an idea of their magnitude; have drawn a comparison between their respective values to the community on a strictly comparable basis; and have pointed out the direction in which the products of the forest might be further utilized for the benefit of the individual manufacturer as well as the State itself. Moreover I have in a fragmentary way touched upon the forests themselves, of which I understand we possess under license nearly 10,000 square miles, giving hints for their better management, increase of growth and preservation. The subject is indeed a large one and may well baffle our legislators. Perhaps much could be done by individual license holders themselves and it is to be hoped some effort will be made on their part, as also the farmers who own granted wood lands, to assist in preserving the national inheritance.

Mr. W. B. Snowball, of Chatham, read the following paper:

Mr. Chairman, Ladies and Gentlemen:--

I have been asked by the Government to prepare a paper on "Value and Importance of Lumber Business to New Brunswick." The subject is a large one and of great importance at this time. If business interests generally do not depend on the lumber trade in our country, why the necessity of the Government calling such a Convention as now convened, and go to the expense they have in this matter? Why are we meeting to talk over and discuss the best means of preserving and perpetuating our Forests? As the heart is to the human being, pulsation and driving life through the whole frame, transmitting energy and power, so the lumber trade is to business life of our Province vitalizing and energising it or depressing and weakening as its condition may be at the time. All other industries centre and cluster around our forest manufactures, and are strong or weak prosper or decline according to the conditions of the lumber markets. To maintain, therefore, in our Province a healthy business life the preservation and maintenance of our forests must command our attention.

President Roosevelt has said—"Wood is an indispensable part of the material structure upon which civilization rests. If forests are destroyed it is only a short time before business interests suffer in consequence."

What does our forest industry mean to our Province? It brings into our Province about ten million dollars annually and of this amount I estimate that about one third is paid out in taxes. Such an industry must be of great importance to any country.

Our Government is dependent on the forest for a large portion of its revenue, \$251,883.25 coming from this source last year, and the loss of the revenue from this direction would mean direct taxation and every man in our Province would be directly affected.

The lumber business, whether for deals or pulp affects more people and interests, more callings and professions than the fisheries or the mines, in fact both these industries are themselves dependent on the lumber. It has been said that abundance of wood is one of the prime necessities for successful mining.

Take the banking business of our province. If the lumber business were to stop, would it not suffer? Some one may say, where would the lumber business be to-day if it had not been for the faith banks had no other industry? Banking and lumbering interests are closely interwoven. Bankers must of necessity be borrowers, when you consider that lumber operations commence in August, and the result of this work is only ready for the market until the following June, especially is this so in New Brunswick, where we have not open ports all the year round.

The sale of lumber products to foreign countries also places a large price on the market, for which all banks are eagerly looking. But not only in this connection are banks benefited but general trade is assisted, payments are good or bad depending on the lumber business, a good lumber year means more money on deposit and, therefore, more for the banks to use. Railways are also benefited, more people are travelling, more goods moving, if forests operations are profitable. They also need the forest and are dependent on them for ties and for material for construction work and for cars.

The manufactures are dependent on the success of the lumber industry. More clothing is needed, more Humphrey's Tweeds, more blanketing, more

staves, etc., more material required for packing cases and crates as the quickened throbs of the lumber pulse announces increasing life.

The Merchants, wholesale and retail, keep a watchful eye on the lumber business, they follow with interest the rise and fall of the markets, and gauge their buying and the credit given by the prospects of good or bad year in the sale of forest products.

But the Farmer, how his interest is bound up with the success of the lumber industry. This farming industry that is so vital to him, and the backbone of the country.

The land owner needs his hay, oats, beef, pork, they need his horses, in fact everything the farmer raises. A ready market right at his door and governed by the condition of the demand for lumber. The country should abound in farmers and wealthy farmers, as they have such a ready market.

We are glad to find the Government encouraging the farmers by grants to better and improve their farms, importing cattle, sheep, and hogs, adding agricultural societies, etc., and we hope the farmers will soon be able to supply the lumber industry with all the hay, oats, beef, etc., needed and thus keep the money in our Province. Heavy draught horses and large cattle are much needed in our country to supply the lumber demands.

One large concern recently purchased horses for New Brunswick in Montreal and paid \$4,200.00 for 18 animals and they did not get as suitable ones as were required. There is a good opportunity in this direction and we are glad to see that the Government intends importing some heavy draught mares for sale in the Province. For successful farming it is said at least 25% of the country should be wooded. Farmers also depend on the maintenance of forests to preserve stream for irrigation, for the gathering of moisture and to protect from cold winds.

The laboring classes, whether in mill, factory, forest or wherever employed, look on the lumber industry as the great barometer that tells what kind of days are coming and by it they gauge the prosperity or otherwise of the year. The success of this trade and the increased demand for lumber makes more men necessary and governs the wages and provides the permanent daily employment. When we consider that a few years since labor about mills and yards received \$1.10 to \$1.25 per day while at other times they get \$1.50 to \$1.75 and in the woods three or four years ago \$18.00 to \$22.00

per month was the usual wage for good men, while today \$25.00 to \$35.00 is paid, you can readily see how the laboring man has benefited by the improved state of the lumber business. No class lives better and spends money more freely than they do when earning good wages and every trade benefits by their prosperity. The government a few years since passed a lien law protecting them for wages earned in connection with logs, the principles of which are both equitable and just and recently has passed more legislation to protect the laboring man.

I might here refer to the Government's arrangement with the Salvation Army and others for the importation of labor. With the increased work in the manufacture and shipping and the improvement in all industries in New Brunswick and the stricter attention paid by the farmer to agriculture, not going out to work in the mill as formerly, the call of the west which was responded to by so many of our young men, it has become necessary for us to labor to be brought into our country. All industries were more or less hampered for the want of labor last season. I would like, however, to impress on the Government and through them on the public, in bringing out the men, that from what I have seen of the Salvation Army and other importation that the right class of men are not being picked. We do not want men who have not been used to labor or who have been looking for work, and not wanting to find it, nor men who have been brought up to easy employments, but we need rugged, sober men, active, industrious, men of medium stature, good physique, married men preferred, who know what labor is and are prepared to do it without complaining. We have in our Province a working class intelligent, industrious, active and we want men imported who can take places alongside of them and be of assistance and not a hindrance.

With so many interests dependent on the maintenance and preservation of our forest lands, is it any wonder that a Government that has done so much for the benefit of our Province and assisted agriculture and other industries, passed equitable laws to protect the working men, should now turn its attention to this important subject and try to include what can be done to perpetuate our forest wealth and at the same time deal fairly with vested rights.

The question, therefore, arises, how can we best realize our timber revenue from the timber lands and in connection with this, how can we best protect this valuable revenue producer from fire?

The Government made a wise move in the land sales of 1888 when they

extended the leases from ten to 25 years. It made the mill owning land holder jointly interested with the Government for the maintenance and preservation of the forest as the success of their vested interests in mills, wharves, tug boats, booms, logging plants, stream improvements and dams, was wrapped up in the continuance of the forests and today I am satisfied that every large holder can report their lands are practically as good, except where fires have occurred, as they were ten years ago. Now let us enlarge on this system so ably instituted by an astute Government, and we find perpetual leases the outcome, as outlined in the present Government's timber limits policy. Link together the vested rights and the Government making a mutual interest and to my mind you have the surest and safest method of perpetuating the continuance of the revenue and the preservation of our forest areas and also the continuance of an industry so beneficial to our Province. I do not think that the Government should delay taking definite action on this policy or put off to some date five or six years hence, the time it will take to prepare plans, etc., the putting of same into practice, but they should let the limit holders know at once what the policy will be for continuance.

With reference to fire protection I think some uniform policy should be adopted, appointing fire rangers to definite districts, who will spend their entire time, from May till October, on their territory, and arranging for the payment of them.

Special attention should be paid to districts through which public roads and railways run and along wood trails, fishing streams and on areas hunted for moose and caribou.

If the conclusions drawn in this paper are correct then every industry should assist in advancing the forest interests and we hope that whether looking at it from the standpoint of a limit holder or that of an interested outsider, who might wish to hold limits, that we will approach it with good judgment, so as to assist the Government in solving a matter of such great importance to our Province.

A. E. Hanson then read a paper on

THE PROTECTION AND PRESERVATION OF OUR FORESTS, WITH SOME OF THE ECONOMICAL RESULTS OF WORKING THE SAME.

Next to agriculture, the chief industry of New Brunswick is the manufacture and export of lumber. Her greatest asset is her forest

wealth. The protection and perpetuation of the Timber Lands and our lumber interests is the all-important issue today for our Government to consider, and our people, having been educated to the necessity of Forestry Education, will heartily support the administration who makes it their aim to give the best possible care for our growing woods.

The waste of tree life by settling and clearing untitled lands for agriculture, waste by fire, and waste in lumber operations, are preventable in a large measure.

The construction of the Grand Trunk Pacific Railway across country through the central portion of our Province, crossing the head waters of the Tobique, Nashwaak, Miramichi, Taxis and Salmon Rivers, and other streams, will, in my opinion, be one of the most objectionable features that this Province has been compelled to adopt in its entire history. From what we know of the I. C. R. north from Moncton, and other railways such as the Gibson Branch, etc., they have done, on account of fire, millions of dollars' worth of damage.

The consequential damages that the G. T. P. will do in the next ten years, if built across the central portion of our Province, will be simply incalculable, and every effort should be made to safeguard this portion of the Country. The heads of the several Governments of the Western Hemisphere are all awaking up to the fact that the time has arrived that demands immediate action be taken in protecting our forests, and schools of forestry are being established throughout the land, and it is suggested here that New Brunswick do the same.

THE NEED OF FOREST PRESERVATION.

Dr. Fernow says in his "Economics of Forestry":

The natural Forest Resources, as we find in America today, consists of an accumulation of wood capital, lying idle and awaiting the hand of a rational manager, to do its duty as a producer of a continuous, highest revenue. The demands today upon the forest products of the United States are greater than the supply.

It is often said that the timber here in our country is inexhaustible. I for one cannot agree with this, and I am going to say here that the time has arrived when the Government of today must advance some rational and up-to-date methods for protecting our lands and forests. The conditions

confronting the lumbermen and the user of his products are today in this Province that we are *potentially* *cut out of our capital stock which no good has ever done it all day*. In the near future our wood must be supplied by 1930-1931 production, not the now commonly despised second growth will cease to be our source of supply. Referring to second growth, I will devote one moment.

Five miles from the City of Fredericton, in New Brunswick, I own a tract of land 220 acres. Fifty years ago it was a field then lately converted into a lumbering area. My name was not on it since that time. It was sold to the Government and has not improved rapidly but this tract is a good example of the species of a forest house of over 14 M. to the acre. It is a very good example of the way in which a valuable tract of land is being cut out of the Province. In the next few years' time it will be cut out and sold to the Government.

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The second growth of the Province is being cut out at an average of about 70,000 acres a year. It is being cut out at an average of about the annual growth of our forests, as a whole, under the present conditions of abuse, is probably not more than one-fifth of that, assuming that they are 10 feet at 100 in one cubic foot, this, therefore, leaves an annual growth of 100 feet to the acre. Now, allowing this annual growth, and assuming that out of the 10,000 square miles of licensed ground in this Province, there is only one-half of it fit to cut over, there will be an annual accretion of over 300,000,000, as against, say 150,000,000, being taken each year, and it must not be forgotten, that the fire-belt is always playing havoc, constructing year by year large areas of good forest lands, and the Government of N. B. P. across the central portion of our chief spruce-producing belt, it was to increase the danger to a very large degree. This is the case of the Government to this particular railway. It would be a very good example of the way in which a valuable tract of land is being cut out of the Province. In the next few years' time it will be cut out and sold to the Government.

and it seems almost accepted that the central route will be the one selected. I assert that it is an unfair and unjust transaction for the Federal Government to adopt this route, endangering by fire New Brunswick's valuable forest assets, on the heads of the aforesaid mentioned streams, when the valley route could be easily taken thereby not only giving more railway accommodation to the 60,000 people settled along the valley, but it will from an economical engineering standpoint be a more advantageous route.

The rise in lumber prices has steadily advanced, also has the rise in timber lands. In some cases in this Province there have been some 50 per cent increases, therefore it is difficult to see any argument advanced why stumpages should not advance pro-rata. This is a burning question. Stumpage laws should be regulated to suit the locality.

The present Government, having called this Convention together, is seeking information from different sources, preparatory to making an advance towards furthering the productive interests of our Forest Lands, and if I may be allowed to advance some few ideas, I hope they will be taken as having had some little knowledge on this subject during my experience of the past twenty years.

(1) I would suggest that there be a more strenuous effort made to enforce the Fire Act, because "a ounce of prevention is worth a pound of cure". And while here, I may say that the County of Westmorland Fire Law was considered a good one when passed, but as the Judge of that particular district has decided that the man who sets fire must be seen actually doing it and will not allow the burden of proof to be upon the transgressor, therefore the law appears to be of little value in a case of this kind. Therefore the Fire Laws they should be amended so that the party suspected be put upon oath and made to state the facts so far as he is concerned.

(2) Stringent measures should be meted out to the licensee of Crown lands who does not comply with the efficient law relating to the undersized cutting of logs. The law today is not adhered to and if allowed to continue it will be one of the means to our depleting our forest. It takes time for a spruce tree in virgin forest to become a saw log of eleven inches and if this law was thoroughly enforced, I feel confident that our reproductive spruce lands would soon regenerate. Let us protect what we have, rather than look forward to such an expensive operation as re-afforestation.

because a forest properly treated will yield a safe investment at no less than 5% compound interest.

(3) I would advise a system of astronomical block lines be run, blocks to be divided into say two mile blocks, valuation surveys to be made each year. By this system a certain amount of stock taking can be had year after year. It must appear apparent that a system must be adopted to keep in touch with the management of our Crown Lands.

(4) A chief forest ranger should be appointed, also forest rangers, whether they be forest ranger or forest estimators. New ideas must be infused into the management of the Crown Lands to get the best results and to suit present conditions and above all to prepare for the future forest crop, that in our next generation will be a source of pride as well as one of revenue.

These forest rangers should be employed jointly by the Government and the licensee they should have cart blanche for calling assistance necessary for putting out fires, and also stopping the wasteful cutting by the operators. They must be men competent to report how much timber was damaged and the location of same so that the Licensee can cut the ensuing year. They should also be able to value and put an upset price on any piece of timber land at the Crown Land sales, and no Crown Land should be sold, without some report made of same.

(5) The Licensee should not be allowed to cut a log down by the old method of the axe, the modern saw method together with taking out the top even as low down as in some cases to 4 inches should be enforced, especially where Pulp Mills are in evidence. The exact diameter depends whether logs are to be used as saw logs or for pulp and on local conditions, but as the present price of spruce it is a poor business policy to leave merchantable timber in the woods. It can therefore be seen that by adhering to the saw method and taking out the tops that a stand of spruce or pine timber, say 200 trees to the acre, there would be saving over 1,000 feet to the acre to the owner of the land.

(6) Great care should be exercised in making and laying out timber roads and as few built as necessary to get the logs. Too many roads not only destroy more timber, but add greatly to the cost of transporting in time of winter, no logs should be left in the woods. The average size of logs placed upon the market today tells the tale, as compared with years gone by.

By this observance alone we know that the forestry conditions are greatly changing and I will continue to do so, if some of the above suggestions are not adhered to.

(7) I would advise the present administration in reference to the tenure of our licensees. There is no disputing the fact that the well established lumbermen with their established plants, etc. holding acres of our Crown Lands should be protected, in the tenure of their lease, and it must be admitted that unless proper steps are taken before the expiration of the twenty five year lease to safe guard these established conditions and interests, the lumbermen will almost to a man attempt to deplete and take away the most amount of wood material within his limited time, and I therefore strongly advise the Government of the day to see to it that proper protection is meted out to their interests.

(8) I would suggest that a commission composed of five men be appointed, say two members of the Executive Government, two practical lumbermen and one scientific man together with the Chief Forester whose duties it would be to manage the Crown Lands. Do away with the Political Machine.

The subject before me is one of very great scope and one that I have given some little attention to for some years and I have touched upon some of the leading features that I think should be attended to by the Department of Crown Lands.

Hon. E. J. Tweedie read a paper prepared by Mr. C. E. Oak of the Miramichi Lumber Company.

BANNOCKBURN, Feb. 16, 1907.

Hon. E. J. Tweedie

Premier of New Brunswick

DEAR SIR,

For many months I have been planning to attend the Forestry Convention when it should be held in New Brunswick but, owing to very important business, that will demand my attention next week, I fear that it will be im-

possible. Therefore venture to embody some of my views in a letter, which you are at liberty to use in any manner you see fit.

In the first instance, allow me to state that personally, as well as for the interests of the company with which I am connected, I am deeply interested in the subject of Forestry, which has had my very close attention for the past fourteen years. First as Forest Commissioner of the State of Maine and later as manager of quite extensive wild lands.

The methods in vogue in foreign countries, as well as all of the data published by the Forestry schools in this country and by the National Department of Forestry in Washington, I have followed closely and while many valuable points have been gathered, I do not think that experience teaches me that the same will be applicable to Maine, or to New Brunswick, where conditions are entirely so far different at present time. In order to make myself fully understood, allow me to state that my experience teaches me that we have not as yet reached the period of deforestation, or in exhausting our forest products, where it is possible, from a financial standpoint, to adopt scientific forestry in any way. The scientific Forestry, as practiced in France and Germany. In fact I will go further and state that I do not think it a practical proposition for any one individual or corporation to adopt scientific Forestry for a number of generations yet to come. My reason for so believing, I can frankly admit, is wholly from a mercenary standpoint. In other words, every individual, company or corporation owning timberlands is looking for a reasonable return from the money invested in the way of annual dividends; and these are not possible, except after a long series of years, from the practice of scientific Forestry. Revenues from tree seeding or planting, or benefits derived from tree pruning, can only be obtained after a long series of years, and considering the fact that mature tree growth, suitable for present cutting, can be bought in the open market at prices ranging from \$2.00 to \$5.00 per acre, according to location, the cost of raising and growing timberland by tree planting would be from \$70.00 to \$150.00 per acre. It requires no argument to demonstrate my proposition that no individual can afford, from a financial standpoint, to seriously consider its feasibility. If, therefore, scientific Forestry is to be adopted, it can only be done by governments, just as long as our forest products remain at prices anything like those at present. Governments must anticipate the future and prepare, as far as possible, to do so, for generations to come. They must, by anticipating their needs, but this is not expected from individuals. Yet, even with governments, conservatism must be shown with reference to

this subject, as well as all others and the lavish outlays which would be required if scientific Forestry were to be practiced on a large scale would hardly be warranted. Please bear in mind that my above suggestions apply to the idea of adopting such methods as France and Germany are at present following, where even the smallest twig or limb has a value; but allow me to add that I do think it advisable, both for the individual and particularly for governments, to adopt certain Forestry regulations, which shall be great modifications of the scientific methods.

Briefly, I will indicate a few of these ideas. First, I should like to see compulsory for all wild land owners, as well as less so for wild lands, that seventy-five per cent. or more of the trees should be felled by saw or other machinery, and that the same should be cut at a low as the soil and roots will allow. This means that on an average a foot and a half in length of a tree of the very best quality and diameter in the tree will be saved from what would result if the tree were cut with axes. A brief calculation will show what this amounts to. For instance, suppose that my lumbermen should cut 10,000 trees annually, which is not a large amount, indeed. If only one foot was saved on the average of these trees, at the average size of those cut in the Province of New Brunswick for mill purposes, the saving would be, at least, one hundred and thirty cords of wood, or, at least, actually nothing to save. In fact, the expense of felling with saws is not less than felling with axes. When a tree is felled it is the duty of every lumberman to take all of the lumber out that can be made available for any purpose whatsoever. In other words, the small trees cut in trucking yards, roads and landing, as well as the tops of the trees, where saw logs have been taken down to quite a small size at the top, should be driven to the mills and manufactured into low grade lumber. This was not the case even at the present time, although it was but a few years ago that lumber was considered the enemy of civilization in this country, and it was possible at any and all times, to bestow a quarter for the sake of a log cabin story. One feature of lumbering that I note to be quite generally practiced in New Brunswick, and which is very commendable, is the practice of felling the large saw lumbering trees in such a way as to leave a large amount of one kind or another of wood growing in the regions about them. I am most familiar with the case of hemlock trees, which are cut in such a way that they require very much more growing and the consequent growth of the early growth, by the method of cutting, I mean, the cutting of the tree in such a way that the cut wood will be left in the ground, and the growth of the tree will be stimulated, and making the tree grow in such a way that it will be a better tree than the one that was cut.

The dragging of logs by means of one horse accomplishes a double purpose. It not only saves the lanky growth, but at the same time, removes the moss from the mineral soil, when the yarding is done in the fall of the year before the snows get deep, which affords opportunity for the spruce to reseed. Fir, as is well known, reseeds very rapidly by germinating in the moss, but this is not true regarding spruce, which is a very much more valuable wood and must have a mineral soil in which to germinate. The idea is discussed very frequently in this region of limiting the size to which trees may be taken, and upon this subject I find a wide range of ideas. In some localities the limit is placed at fourteen inches at the butt, while in others it is twelve or ten, and even no limit whatever. In my judgment, it would be wise and proper to place a limit where it is mixed growth and where future crops may be expected from the under-sized trees left standing; but all must realize that there are many exposed places where, if the lumber is thinned, allowing the winds to enter, it is almost sure that the balance of the growth will blow down. When this condition results, the effect is far worse than as though the ground had been absolutely deforested. It is also true that there are many lowlands where perhaps the extreme size that trees ever have grown, up to the present generation, may be only ten or twelve inches, or even less, on the stump. In such localities, whatever wood is removed by the thinning process is clear gain, because the growth on the balance after thinning, in many instances, is much greater than the growth on the whole stand before the thinning takes place.

By following the suggestions as above outlined, much of the lumber that heretofore has been worse than wasted, because when left on the ground it served as fuel for forest fires, will be saved, and material advance along forestry lines will be made, and when these methods are once fully established, they will suggest other ideas for still further improvement. Making it compulsory to take the small sized trees, when once cut, serves a double purpose. As the profits from small sized trees are very small, when the lumberman is obliged to take them, if cut, he will be much more conservative, and plan to leave a much larger stand of under-sized growth than by present methods. The expense involved in adopting methods outlined is very small, because it simply requires the supervision of a few experienced men to see that the different operators conform with the rules and regulations. It is not fair to expect that best results will be obtained in one year, because it would be a somewhat radical change, but after two or three years experience there is no reason why every operator may not have reached fairly satisfactory results along these lines. Prior to any cutting having

been made, however, is the necessity of properly guarding our forests against fires. It is a matter of common knowledge that throughout the larger portion of the lumber regions in this latitude fire has done as much, or more, injury than the axe, and in the future the danger is even greater than in the past unless proper care is exercised. It is almost impossible to avoid a forest fire of any great magnitude, but it is feasible and inexpensive to guard against any such fires even having started. At all exposed points or thoroughfares or routes through the forest, patrols should be located during the drought seasons, in order, particularly, to caution the people passing to and fro and to extinguish any small fires before they shall have gained any great headway. The periods for patrolling are comparatively short, usually not exceeding three or four weeks in the Spring and a like period in the Fall. It appears to me that there is no one expenditure that a government can make that is likely to be of benefit to future generations like that of guarding our forests against fires, and I earnestly urge that the Forestry Convention about to assemble in New Brunswick shall discuss ways, means and methods of best controlling fire and guarding against their having even occurred. The interests with which I am connected in your Province will be glad to join with you in any efforts you may make in this respect. In fact, we expect to locate patrols at our own expense each season at exposed points about our fee, as well as our leased lands, and while the saving may be directly to our benefit, indirectly the benefits to the Province must necessarily be very great.

Trusting that your convention will be productive of great good, and again regretting my inability to be present, I am

very truly yours

CHAS. E. OAK.

GENERAL DISCUSSION

MR. LEBLOND. There was one point, Mr. Chairman, of a very interesting paper you have just read, upon which I would like to hear a discussion by the Members of the Convention: it is this, in the Government regulations, the minimum size of trees to be cut is 18 ft. long and 10 inches at the top. I notice that in Mr. Oak's paper, he refers to the minimum



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size as ascertained at the butt, not at the top. I would like to have some opinions from the lumbermen present as to whether or not some change in the regulation might not be of some advantage, that is, to change the standard to the butt rather than the top.

THE CHAIRMAN—What is your own view upon it?

MR. BIRCHILL—My own view is that it should be regulated by the size at the butt and not at the top. One reason for that is that it is now very easy for a woodman to chop down a tree by mistake. All our jobbers have instructions not to cut logs under a certain size, at the top, but it is very easy for a woodman to explain that he did not think it was so small, but if it was stated that he should not cut anything under a certain size at the butt, it would be very easy for him to distinguish between the sizes in that regard.

MR. CONNOLLY—I do not think you could control it, cutting that way. I think it would be wrong. I say it should be measured by the top, and if you cut the log down at say 16 feet 10 inches at the top, you will not be very much astray. You can tell when you see a tree whether it is going to make a good log.

MR. ROBINSON (Speaker)—After logs are cut or removed, suppose the Government scaler, or inspector, or forester goes through the woods and there is nothing left but the stumps. How can he tell what the size was at the top?

MR. CONNOLLY—In answer to Mr. Speaker, your survey bill will pretty nearly tell you that. If a log is cut down in 18-10, the next log will not be over 8 or 10 inches. In speaking of that, there is one thing I would like to bring before you. We go into the woods and cut a tree down in 18-10, and the general run will be 12 or 14, and 8 or 9, too, when you run the next log out, at 8, 12 or 16 feet and five inches, I think you should not pay stumpage for it. I do not think there should be any stumpage charged on a log of that size coming out from the top of the tree. Is that the case, Mr. Chairman, in your own county?

THE CHAIRMAN—I found in my experience that there were very few trees taken out at all, they were all top.

MR. CONNOLLY—I think in making a contract and taking out those tops, it has cost 75 cents or a dollar more to take that stuff out than to get the log out, so I do not think we should pay stumpage for it.

CHAIRMAN—Suppose you owned the land in fee, Mr. Connolly, and were cutting it yourself, would you leave those tops in the woods?

MR. CONNOLLY—No, we do not, the people I am representing have a good deal of soil right; but, on the other hand, I think that really the Government has no right to collect stumpage on stuff that would be left to rot in the woods, unless we go to the expense of taking it out. Why should we pay for stuff that would be left under your present regulations?

MR. CHAS. E. FISH—With regard to ganging the trees by the tops, another reason which occurred to me that was not mentioned, is this, that a great many trees are what we call stalked in the woods, they are larger around the butt in proportion to the height than others, and when you find a tree large at the butt, it is generally smaller at the top. Why this is, perhaps scientific men will tell us. But one other reason is—the last speaker says it will cost the merchantable lumber more, where you attempt to bring out the tops. Now, I have been given a practical illustration of it, winter of an operation, who operated very extensively, and left all the tops in the woods. The matter was brought to his attention, and he is back this year operating. The operation will amount to close on to a million, and this year he will bring out the tops; and when the operation was figured out, he informs me it is paying, and will pay handsomely, because, although the tops bring only a small price, yet, when he is there with his outfit and under all this expense, the small price he makes, when it is added to the large price for the merchantable lumber, it gives a better price than when he left the tops out of the reckoning altogether.

Prof. Austin Cary, of Brunswick, Me., now of Harvard University, read the following paper:

FOREST POLICY OF THE UNITED STATES AND OTHER COUNTRIES.

The subject assigned to me, by your Surveyor-General, is a very large one, and yet the policy of those Countries in which forestry, by general consent, is considered to hold its true place may be summarised in a few words. In brief, it consists of Government ownership of a large share of the wooded area, and that administered under a system which combines the principles of science, and of good business management, in one. With the exception of Great Britain, all the strong and enlightened

Countries of Europe have that policy established. Great areas of forest land are owned by the State or by Cities and Towns, and those tracts are managed by men of thorough professional training. The objects of that policy are threefold: 1st, revenue; 2nd, the production of the raw material of industry; and 3rd, the securing of those beneficial influences on climate, water flow and the fertility of soil which bodies of forest land scattered through a country are believed to render. This policy is maintained, not as a matter of sentiment, though sentiment approves it, but as a matter of clear public utility, because every informed man knows that the maintenance of some such system is fundamental to his Country's prosperity. Along with it goes some kind of supervision exercised in the name of the State over the handling of privately-owned forests.

Forestry affairs in the United States present a very mixed appearance. There are no town or city forests. Most of our States, years ago, parted with their Public Lands; and only a few have adopted the now slow and costly policy of securing state forest reservations. In the case of the great areas of land owned by the general Government in the West, the situation was more hospitable. There, after long agitation, the policy of retention of ownership was adopted some ten years ago, and to date about 120,000,000 acres of permanent forest reserves have been proclaimed. The organization to manage that vast area is just now in process of formation. At the head of it are a few bureau chiefs at Washington, a group of highly-trained young men, under the leadership of Gifford Pinchot, head of the whole U. S. Forest Service. The force on the ground consists of a mixture of Western woodsmen, brought up in the country, and familiar with its conditions; a considerable number of technically-trained men, graduates of Yale, and the other Forest Schools that have sprung up through the Country. These two classes of men, the practical man so-called, and the man of special and theoretical training, are out there on the ground now, co-operating in the work of present administration, and competing freely, on the basis of actual proved efficiency, for mastery and leadership in the future. The work there is plain, business-like. It consists of protection from fire and plunder, of the sale of timber, of such regulation of cutting and other operations as will tend to the maintenance of the productive power of the lands.

As for privately owned lands in the United States there is little or no exercise by public agencies over their management. This is recognised to be a very difficult matter to handle. There is, however, a great volume of educational

and co-operative work going on, paid for by the Government, by the States, by the Universities, and by various voluntary associations. This work is essential in our conditions and as a rule it has proved very profitable. Correct sentiment is being created, sound information is being spread, and, together with the trend of events, it is gradually improving the character of actual forest management.

To review then, the things which I can tell you of as used elsewhere, and as far as one can see likely to prove serviceable in the conditions of New Brunswick, are: 1st, Government ownership of the tracts of permanent forest; 2nd, Skilful and business-like administration of the same; and, 3rd, Well-directed lines of public education.

The value of these ideas to you will depend on their correct application, and here an outsider, though from only so far away as the adjacent State of Maine, is bound to speak with diffidence. Every situation has its own possibilities and difficulties, and these are to be successfully dealt with only by men familiar with them in all their bearings and aspects. If, therefore, I go further, and consider application to New Brunswick conditions, the friendliness of a near neighbor and the interest bred by two seasons of timber work in the Province, and acquaintance with many of your officials and business men, will have to be my excuse for doing so.

First of all, you are in a splendid situation as regards the ownership of the land. To whom or to what circumstances the established land policy of this Province was originally due, I do not know, but, at any rate, its pursuit till the present time leaves you in splendid shape for forest administration. You have not to acquire land by costly purchase, as most of our states must do. The land is yours, and Government and people have but to exercise their prerogative, and make up their minds, in order to settle all essential questions of management. There is, too, another great advantage, in that the land is a source of revenue. You have not to draw on the pockets of the people in order to pay the costs of improved administration.

In connection with administration itself very many questions arise. There are the sale of timber, the regulation of cutting, economy in operation and in use, fire protection for the standing forests, the system of exploration and survey which shall yield and preserve the detailed information on which alone intelligent administration of a forest property can be based. The value of each of these things I am sure must be understood. They are what a private

owner looks after at once on coming into possession of a new property, as of vital importance to him.

There are a few reflections on this subject that come to me, in part from my acquaintance with New Brunswick, in part from our home experience. These are, first, that spasmodic and irregular work is of little account. A consistent policy consistently carried out, even though not perfect, is far better than occasional efforts and spasmodic reforms. Secondly is the idea that good forest management is a matter largely influenced by definite location and circumstances. Treatment by general rules and at long range lacks very much of being the most efficient. Things have got to be settled in view of all the facts to be seen on the ground. Thirdly, is the idea connected with this last, that laws and regulations passed will not be the business, but have got to be followed up by men, active and efficient men, men on the ground, before anything of account can be secured. So, for instance, it has proved in fire protection with us. Well-meant laws were on the statute books of our states since Colonial times, but they never amounted to anything till state and local fire wardens were appointed to look after their administration. So it has been wherever careful regulation of woods operations has been tried. Well-meant and carefully framed rules have failed, have operated so, sometimes to defeat their own ends, until they were backed up by men to look after their execution.

So it seems to me will it be with your own new forest law. Its good intent is plain. The substantial nature of the objects at which it aims is clear; but as I read its provisions, I was led to ask in my own mind what exactly is the organization, and who exactly are the men to whom are entrusted the task of carrying out its manifold provisions; Leaving aside large matters of policy, whose is the less showy, but no less important task of devising plans, of mapping out work, of passing regulations and carrying them out, of settling day after day and year after year the minor questions that are bound to arise? Here it seems to me is a main and crucial point, for on the character of that administrative routine work will turn in great measure the success of your forest policy and the welfare, so far forth, of the Province. A permanent and well-equipped office of forest administration, therefore, under skilled and permanent leadership, with means at its command, with authority in minor matters, with a force of men engaged in executing its orders and at the same time amassing the fund of information on which its administration of policy must be based—this seems to me to be the plain, insistent demand of the situation.

What will be the cost of such an organization and where will men to fill it be found? To the first question my answer is that whatever it may cost to properly protect and administer the great forest property of the province, the expenditure is certainly worth while. As for the second, my acquaintance in New Brunswick leads me to think that the men required are already here, waiting only leadership and opportunity to form an organization of the most effective kind. There are no better woodsmen than those of New Brunswick, and no better stock from which to make foresters in the technical sense than the young graduates of your University afford. In your Crown Land office too, if I understand it aright, are men who for many years past have managed the provincial lands with great capacity and zeal. I have these men, or men like them, sufficient freedom, means and backing, and the problems of protection and of management will in my judgment be put in the way of an early and correct solution.

Education is a most important phase of the forestry movement, popular education more so perhaps than that of the professional forester. I would gladly talk on that subject but others are treating it most effectively, and I will therefore turn my attention for the few remaining moments during which I shall speak to two special matters.

First, as to the character and utility of technically trained foresters. The word "forester" carries very different implications in different places. A forester in one place is simply a practical woodsman; in another place the term may apply to a supposed great authority whose word on the line of his subject is not to be disputed. In another place again, the term by common application may mean a mild crank or enthusiast interested in certain things and perhaps interesting himself, but having little or no actual influence on practical affairs.

It is inevitable that this confusion should exist at the present time, but it is equally true that if the term is to remain and to stand for anything, it has got to come out of the mists and define itself into something tangible and serviceable to the people. And the idea which some at least hold who are connected with the profession, the ideal which I personally hold as a teacher of forestry, is that the forester must be closely allied to the engineer, must be in his line a thoroughly equipped and efficient man, in actual charge of woods and woods operations. Sound scientific training enters into that idea and actual responsibility and experience are involved in it as well.

What I want to urge upon you is the employment in your organization as early as possible of a few men of this type. If you can't train them properly yourselves, we shall be happy to lend you the services of our forest schools. But, when they have got their training, put them out among your force of sealers and surveyors, give them opportunity to work and to learn, and then watch carefully the results. Such men, if only they were well chosen in the first place, have every qualification for efficiency and success. They have the physical stamina and the intellectual keenness required. They have ideals derived from a knowledge of the achievements of other countries and other times. They have the ambition and inducement to work which come from having invested money in education and being definitely committed to a career. Such men as these have done much of what has been accomplished in the United States, and they are now bearing great burdens of responsibility in our forest reserve organization. A few such men put into your New Brunswick crown land system now will, I believe, after a few years, be motive power and balance wheel of the whole thing.

Lastly, gentlemen, I ask you if while you are preparing your permanent plans and consolidating your organization it will not be a good thing to take a hasty survey of your forest resources. Your permanent system of exploration and survey is an important thing. It wants to be carefully planned and its execution will cost money and take time. It ought to go on from year to year under the guidance of a permanent organization. But a hasty survey, that should give you a rough estimate of your resources and discuss broadly the factors which enter into their control and management, might be very instructive both to officials and to people, and serve as a basis and starting point for more elaborate work. In this direction we can give you from the other side a few serviceable examples. Best is the survey of the State of New Hampshire, made by a force of men from the U. S. Forest Service, whose results in the shape of map and report may be seen here. That survey covered an area, in the gross, of 9,000 square miles and cost in the neighborhood of \$6,000. It gives the area and location of wooded lands in the State, the area of burnt lands, of lands cut over and of those still virgin forest. It gives careful descriptions of the nature of timber resources and rough estimates of their amounts. It summarizes the mill business of the State and discusses it from the point of view of permanence and economy. A thorough study of forest fires in the State and means of combatting them is also made.

Such a survey as that though hastily made gives the people and legis-

lators of a State a broad and rounded view of their forests which is not otherwise to be obtained. It serves as a basis of legislation, and it makes it possible to plan subsequent work more intelligently. Judging from what has taken place on one side, I can think of nothing that would better serve the Province of New Brunswick at the present time than one or two seasons spent by a small but well equipped party on such a survey.

MR. HUTCHISON—May I be permitted, as one of the listeners of this Convention, to suggest, that we have derived very much information from those members of the Province of New Brunswick, and vicinity, but we are still more indebted to those gentlemen who have come from a distance, without reward or hope of reward, and with great loss of time, in order to give us the benefit of their knowledge on this subject of Forestry. From these gentlemen we have learned how they manage the affairs of Forestry in the United States and Canada, and I would ask the gentlemen present to give a hearty vote of thanks to those gentlemen who have addressed us on these subjects, viz., Mr. Stewart, President of the Forestry Association of Canada, Mr. Price, who is the Vice-President of the Canadian Association; also Mr. Power, and Mr. MacMillan, and the gentleman who has just addressed you, and given you the information as to the affairs in Forestry in the United States, Prof. Cary.

Motion seconded by Mr. Comodly, and carried unanimously.

The vote of thanks of the Convention was tendered to the gentlemen named by the Premier, for the very great assistance given by them in this first Forestry Convention.

MR. PRICE in reply—Mr. Premier, on behalf of the Quebec Convention, I have to thank you very heartily for the vote of thanks. I think we cannot help expressing the appreciation with which your Government has carried on the work here, the facilities you have for preserving your documents, etc., cannot be better, and also the efficient way apparently with which the whole machinery of your department is run. We come, Mr. Hutchison has said, without any hope of reward. I may mention that a friend of mine in the Province of Quebec, at the time when lumbering was not on the sound basis it is today, said, "If I had an enemy, I would give him a saw-mill." Happily, that time has passed away, and it would be a kindly action if any of you should give your friends a saw-mill, and not an

enemy. I may say that if you have any saw-mills to be given away, we will be very glad to have them. But it is not for the hope of reward that we have come down here. I have to thank you, Mr. Premier, and your Government for the cordial way in which you have given us this vote of thanks.

FLWART: Mr. Premier, ladies and gentlemen, I must thank you very sincerely for this vote of thanks. It is quite unusual in our meetings to thank those who come to give addresses on this occasion. But Mr. Price has said all that is necessary on that subject. I can lose everything he has said except with regard to the saw-mills. I had a saw-mill I would not fall in with his suggestion.

I have now, Mr. Premier, very gently and very slowly, as in the line of interest that you are taking within the last few years on the subject of Forestry. It is a little over seven years since I was asked by the Dominion Government to undertake the formation of a Forestry policy for the Dominion. I found that scarcely anyone knew what we were talking of. The Minister of the Interior asked me what I proposed to do. He said: "The Premier has sent a letter regarding the matter and thinks it would be wise to do something, similar to what other countries do," and asked me what I proposed to do. "Well," I said, "it is a pretty hard question to answer at once, to develop the Forest policy for the Dominion of Canada at a moment's notice." I said: "If you care to appoint a Commission, such as the Ontario Government did, such as the Washington Government did a few years ago, they may be prepared to formulate a policy which you might see fit to adopt." Those of you who know the Minister of the Interior will recognize the personal characteristics of his answer. He said, "We generally appoint Commissions when we do not intend to do anything. If you care to take hold of it, do what you like, and when you arrive at a plan, submit it, and we will adopt it if we think wise." Shortly afterwards, I went to Washington on the American Forestry Association, and on the way back, it occurred to me that a good thing for this country, to awaken the public interest in this question, would be to form an Association in Canada. I came back and called together some men, and the result was the formation of the Canadian Forestry Association, which has been the means, in my humble opinion, of creating an almost Canadian national interest in the subject of Forestry. Almost, or very shortly after, to show how little the term "Forestry" was known in Canada, I asked a gentleman to propose at one of our Forestry meetings. "Well," he said, "if you had just been here a day or two ago, you would have seen Dr. Oronkytokka, and he is head of the whole bunch."

Of course there were men all over the country who had thought of this subject, but as another illustration as to how little it was known, I happened to be in Germany a year or two ago, and in going through the Black Forest with one of the Over-foresters, I said, "You should some time or other visit Canada." He said he had already done so, but had seen very little of the forests. He had gone over from Buffalo to Niagara, and thought he would present his card to someone at the Niagara Falls club, and did so and told him that he would like to see some of the forests of Canada. He said this young man looked at him in a very patronizing way and said, "I want you to understand that this is a civilized country, and we have no forests."

Every country must work out a system for itself. Our system in the West on tree planting—which I will not go into now—our system of forest guarding there, would be perhaps entirely inapplicable in New Brunswick. When I started the system of forest tree planting—we have now, I may say in passing, a Forest Nursery, 520 acres, where we grow the trees for distribution on the bare prairies, serving those who have no timber whatever—shortly after I had looked over the system adopted in other countries, Europe, India and United States, one of our old pals had been over to Belgium. When he came back, I told him I was working out some system. He said, "We will have to do as they do in Belgium, although it will cost a lot of money. I saw them going out planting the trees for the people. It will cost a lot of money, but we will have to do it." I saw the absurdity of it, of course, but I did not say anything then. Shortly after, he called me in, and said, "Did you think over that question?" I said, "What kind of an army are you going to have, to plant trees all the way over those North-western prairies to the Rocky Mountains? I would advise a system for the settlers. They enter have an agreement that they will cultivate those trees. Then we visit the ground trees are set out, we look at the soil, what trees suit the soil, then after they have entered the land, we follow that up by inspection, until the trees are mature and ready for the axes. Now, I have not been able to find any system of tree planting, or generally at all, at present time. We have succeeded in planting 100,000 trees this spring, now we have had an examination of the trees, and ninety per cent. of the trees set out have gone, and the remainder are growing well."

Then, in regard to the forest reserve, I said, "I have seen a few of forest surveys. Of course, the country is very large, and it is not that beneficial, but the area of timber land owned by the Government is very large."

than that of all the other provinces combined, and in order to guard that immense country, all the way to the icy sea, it would require an army of men—but it does not require to be guarded everywhere. Forest fires do not occur except from natural causes, through the settled district. But we had the Hudson Bay District give fire notices, where it would have cost hundreds of dollars for us to have done it. I have found these notices posted up all the way from the Arctic Circle down. They are put up by the Hudson Bay officials and warn the settlers of fires. That alone has saved thousands of dollars of valuable timber. I mention this to show what is applicable there, and that we have to use means there that perhaps would not be applicable to other provinces.

Now, with regard to a statement which was made, as to the enormous extent of timber land in that new country—I think such a statement without qualification is apt to do mischief. It is true we have large belts of spruce, but to take that statement and to suppose that we have timber all over that area is fallacious. We have a quantity of pulp wood, but the vast quantity is growing on the Arctic Sea, where for many, many years it will be unavailable.

I do not wish to take up your time. I have been more than pleased with this meeting. I think the Government and the Members of the Legislature and the people deserve very great credit for the interest they have taken in this matter; and I may say that I am more than pleased with the unanimity which has characterized these meetings everywhere, not alone here, but in all parts of the Dominion. I have said before and I say it here now, that this is a national question—the preservation of our forests; that it is too great a question to be the foot-ball of any party. There are enough questions to be relegated to and dealt with in that way. And I am glad to say that throughout the whole country, we have had the hearty co-operation of all parties—not only political parties, but of religious denominations as well. In fact, the whole question is taken hold of by the people of the country in a most patriotic way.

MR. GEORGE ROBERTSON (to Mr. Stewart). Did I understand you to say that the Dominion Mounted Police acted as Fire Wardens? Is it part of their duty?

MR. STEWART. The Mounted Police do; they have instructions to do so wherever they can, and in many cases we have them detailed for special service, although that must not interfere with their regular duty.

It is not their regular duty, but still they have instructions from the Commissioners to do all they can in that regard.

I may say that I am about leaving the service, but I will not lose interest in the Forestry Association at all, but if I were remaining, one of the things I would do, and it will probably be done, would be to have some sort of force, either the Mounted Police in the North country, especially to take charge of the guarding, or have some force similar. Because the Indians and the people there pay great respect to the Red Coat, or the Mounted Police uniform, and since the new provinces have been formed, they will take over the administration of justice and in many cases they will probably disband a number of the police and I was hoping we might be able to retain some of the best men for the Forestry branch.

PROF. CARY - It gives me great pleasure to acknowledge your vote of thanks and hearty welcome here. I am greatly surprised to find myself the only American Forester here, because we have always felt it our pleasure and duty to attend conventions of this kind. Mr. Pinchot and Mr. Price were expected here, and I am sure it was with great regret that they were not able to attend. I feel sure that you ought to feel great encouragement and great results from your Convention here. For my part accept my very hearty thanks for your very cordial welcome.

MR. POWER - Mr. Premier and gentlemen, I thank you most heartily for your vote of thanks and I assure you we will carry back to our provinces the most warm and kindly feelings for the people of New Brunswick, knowing the hearty interest which has been taken in the subject of Forestry.

MR. MACMILLAN - Mr. Premier, ladies and gentlemen, I wish to express my thanks to you for the privilege which has been accorded to me in coming here, and to say that I am only doing what many Canadians are doing at the present time, going down to the United States and learning as much as possible from their Forest schools and system of Forestry, and getting the encouragement they may give in the success they have attained, so that we may come back to Canada and in the better service, do here what they have done down there.

MR. HILL - Mr. Chairman, there is an enemy marching against our forests that is more dangerous than the axe, more dangerous than fire, more dangerous, I may say, than even this Forest Convention - an enemy that is known in the United States and in Europe as the Brown Tailed Moth. Now,

according to reports, it is destructive to the foliage of all the trees, and it is about impossible to eradicate. I do not refer to the Gipsy Moth, in regard to which the United States Government has spent nearly a million dollars, but this is still more destructive and difficult to reach and it has arrived in the County of Washington, adjoining the County of Charlotte in this Province. I am told that already their spies or pioneers have arrived to spy out the fatness of the land. They come through in the box cars that pass through the State of Maine. The destruction they make is said to be very great—whole forests denuded, just as if fire had passed through them. And then, by contact with them, it is said, they bring on an illness—so poisonous are they, it is said, that hairs dropping down from the bushes against one's flesh will produce serious results. What I wish to ask these gentlemen is, if they are so destructive as is reported, and also if they confine their destruction to the round leaf or deciduous trees, or whether they attack firs? I would like to ask, for the information of this Convention, whether that enemy is so much to be dreaded, whether it is so destructive and whether it attacks other trees than what we call the hard woods?

PROF. CARY—Mr. Premier, I am not a first class authority on that subject, but I have a general knowledge of it. The moths so destructive in Massachusetts are destructive to soft wood growth, to a considerable extent, as well as to hard wood growth. But it is certainly hoped that a stop will be put to their incursions before real wholesale destructive work is done. The analogy of things of that kind is favorable to hope, and we have many scientists at work on the problem in a most thorough-going, effective way, endeavoring to meet the difficulty. The history of such things in general has been this, that after a pest of this kind has developed to a certain extent, some enemy to the pest develops on its heels and finally catches up and destroys it in turn. So we hope to find somewhere on the face of the earth—and our men are exploring for it—some enemy or disease of the Brown Tail'd Moth, which will attack them and finally clear them out. Our scientific men are working on that line and hope to be successful. There certainly is considerable danger of wholesale destruction, but we hope for better things, and that this pest will be headed off before it assumes proportions which are really notional in their destructiveness.

MR. HAZEN—Would it be in order at the present time to present a report? Among the Committee appointed yesterday, on the motion of Mr. Gregory, there was a Committee, none of the members of which were to be lumbermen, perhaps I may say that it is composed of Dymen, rather than

Lumbermen. That Committee met this morning, with Hon. Mr. McClelan as chairman, and has prepared a report, which is as follows :

(See Mr. Hazen's Report, page 134.)

FOREST FIRE LAW OF WESTMORLAND COUNTY

Mr. Chas. E. Lund, D. L. S. of Westmorland County, read the following paper :—

Mr. Chairman, Ladies and Gentlemen,—

I can assure you that the very few words I have to say will not occupy much of the valuable time of this convention. I congratulate those having the matter in charge upon the excellent program furnished so far, and feel that they will be pardoned for the little error they have made in calling on me. It was doubtless an error of the head and not of the heart.

I was asked to say something in regard to the protection of our forest lands from fire. It is a large subject to be placed in small hands, with such short notice.

Longfellow, who by the way was born just one hundred years ago this very week, in beginning his notable story of *Evangeline*, wrote, "This is the forest primeval. The murmuring pines and the hemlocks bearded with moss, and in garments green, indistinct in the twilight, stand like Druids of old with voices *sad* and *prophetic*." While the words "*sad*" and "*prophetic*" were perhaps given no such meaning by the poet as I attribute to them; yet, I sometimes think that not only the "pines" and "hemlocks," but the spruce, and the fir and the cedar, if given the power of speech, would raise their voices in solemn protest against their wanton destruction by fire and otherwise, that is constantly going on in a wail, *loud* and *continuous*, as well as *sad* and *prophetic*.

It is just now beginning to dawn on the minds of many persons how great an inheritance was bequeathed to us in the forest lands of this country. Only a few years ago, the pioneers of our back settlements, as was well said by some one yesterday, looked upon the forest as their natural enemy, and did what they could to destroy it, not only chopping down, cutting up, piling up and burning off valuable timber in making their clearings, but frequently

permitting their fires to run unchecked into the adjoining timber. A little foresight then would have saved hundreds of thousands of dollars for the present generation, and, in my opinion, a little extra forethought at the present time, embodied in careful legislative enactment, will preserve untold benefits for the coming generations.

The depletion of our forest wealth by lumbering operations, though greater than is generally supposed, is not nearly so great a menace, as the destruction by fire that is going on from time to time. A decade or so will quite largely repair the damage done by an ordinary cutting, while scores of years must pass before land, once burned over, can again be of any practical value for timber. Hence, while wise laws should govern lumber operations, very stringent measures should be taken to protect from fire.

Forest fires originate in various ways—from locomotives on railways, from carelessness in clearing up land, in operating portable mills, from lack of care in properly extinguishing camp fires and fires for cooking purposes, from thoughtlessly dropping burning matches, cigar stumps, and ashes from pipes, from discharging fire-arms, and sometimes by the fire itself.

Though hard to find a panacea for the complete cure of all these cases, yet something can be done along each line. Much has already been done by good, practical legislation, though perhaps more remains yet to be done.

Agitation, legislation, education are the great threefold bulwarks that must be raised in protection of our forests. Agitation will always lead to legislation and, this, supplemented by proper education, is bound to have effect.

In all reforms, when the people are educated, to a wholesome appreciation of the law, rather than a dread of its penalties, then the battle is largely won. The great questions of forest valuation and preservation should be brought prominently before the minds of the rising generation during their school days. While I do not believe in the multiplicity of text books, yet, I am fully convinced that a small treatise embodying the location, extent and estimated value of our forests, their usefulness, the necessity for their preservation, a summary of the law relating to their protection and other such information, placed in the hands of our boys and girls, who so very soon will be men and women, would be a great step in advance in our educational system.

The most destructive forest fires in recent years, coming under my observation, have originated from railways. The law makes it incumbent on section men to see that fires do not spread from that source, and doubtless they do much to prevent it. But the frequency with which fires start in this way is an emphatic answer, that the present law is not practical. Even if all section-men were disposed to do their best in this regard, they could not be depended on. When a broken rail and a fire are both in view at the same time, we all know which one will receive attention and which will, of necessity, be neglected. We require legislation compelling the management of all railways to employ competent persons during the Summer months, to absolutely prevent forest fires spreading from these roads. The present law also imposes penalties on railway companies and drivers, whose engines are not properly provided with screens to prevent fire escaping from smoke-stacks and ash-pans. We must have legislation that goes one step further and provides proper inspectors to see that the law is complied with in this respect.

The present law respecting fires for cooking and obtaining necessary warmth are about all that could be desired and will doubtless be most effective when men learn to observe them. In reference to the most effective punishment of the fire-fiend, who wantonly sets forest fires, I thought of suggesting to the Surveyor General the propriety of reserving a lynch-tree on each hundred acre lot in certain localities for their special benefit. But at present I refrain from pressing the suggestion.

Forest fires, like the smallpox or other dread diseases, should be met by vigorous action at their very inception. To effectively do this we need organized effort—a chief warden for each county, and a competent deputy at every danger point. These should be men trained in the work—taught to act promptly and decisively. No fire is beyond control in its early stages, or can ordinarily do much damage the first day. Nearly all forest fires burn low at night and few can survive a well concentrated attack very early in the morning. Commence operations "just at the peep of dawn," as we say, cut off its progress by trenches, keep it out of the trees and you are master of the situation. Proper organization for this work will entail some expense, though this would be trifling compared with the great losses that usually follow a less persistent course.

This expense should be borne in part by a small tax on all forest land, and in part by municipal or provincial aid. The owners and the licensees, who from year to year properly carry on lumbering operations are, I think,

among the greatest benefactors of the people, and should receive such reasonable consideration, as it is in the power of the State to bestow. The following quotation from my annual report, which some of you may have read, further expresses my views in this respect:

"Violators of the Forest Fires Law should be prosecuted at the expense of the municipality or province instead of the land owners directly. The forest land of this country is one of the greatest assets of the people. It is the basis of many industries and the stimulus of most, and the owners are not the greatest sufferers in its destruction. Every acre of lumber land destroyed by fire means a far greater loss to the general public than to the proprietor, inasmuch, as the amount of wages paid out in operating is much more than the direct profit to the owner."

In Westmorland County we have a very good law in respect to forest protection.

This Act was passed in 1904. The land owners agreeing to tax themselves in order to secure better protection from the ravages of fire. It provides:

- (1) For the appointment of a chief ranger for the county.
- (2) For the appointment of deputy rangers for each parish.
- (3) It provides for placarding the county from time to time with a summary of the law, and any notices we see fit.
- (4) It gives the chief ranger authority to prevent the operation of any portable mill in or near forest land, only under certain conditions.
- (5) It authorizes the ordering out of men to assist in stopping the progress of fires and provides for the payment of these men.
- (6) It imposes a tax on the owners of all forest land of 100 acres and upwards.
- (7) It regulates the setting of fires in clearing up land.
- (8) It provides for the punishment of offenders under the Act. This we want amended.
- (9) It outlines the duty of any person setting a fire.

(10) It makes it incumbent on persons having fire on their land to prevent it escaping to others.

The necessity for a much more comprehensive Provincial law is very apparent and before closing I would suggest that this matter of forest protection from fire, receive careful consideration from our legislators during the present session; and express the hope, that, in view of the increased revenue of the province, that such measures may be taken, as to make it possible, to throw around these valuable forests, such a mantle of protection, as will materially conserve this great inheritance for coming generations.

PRACTICAL FORESTRY

Mr. W. H. Berry read the following paper :

We have heard and read considerable about reforestation and my idea has always been that while it was always advisable to be forever setting out a tree and to the interests of each individual in the Province of New Brunswick to take some personal interest in this matter I have always thought that the planting of the seeds and seedlings of the different growths which are peculiar to New Brunswick hardly practicable. For this reason, and, I will give you an illustration. For instance, after a forest fire in a spruce country there immediately rises up a growth of white or grey birch over this burnt area. After a few years when they have attained sufficient size to shade the ground somewhat and from the falling of the leaves to add something in the way of a forest mulch to the ground the young seeds of the spruce and fir will take root and come up in a thrifty condition. These will grow in symmetrical forms protected from the hot suns of summer by the grey birch and also from the winds in winter which I feel would have a tendency to stunt their growth were they exposed. They attain in a few years a growth sufficient to gradually kill off the grey birch which in dying down add their portion to a very great extent to the forest mulch for the reason that they very readily decay. The spruce then having a start of a number of years will continue to grow and eventually where you have had a grey birch growth immediately after the fire in from ten to fifteen years it would surprise you how quickly this has been converted into a softwood growth of spruce and fir. On the other hand I will refer you to some of our old pastures or fields that have outgrown their usefulness and have been allowed to grow up in bushes. Almost invariably this ground will come up

in spruce and fir and this growth is what has caused the term pasture growth, which denotes a tree with limbs to the ground, scrubby and of no practical use for lumbering purposes on account of limbs and knots. These examples which I have quoted will give you an idea of the difference between seeds that have grown in the open, as seeds have to were they planted, and seeds that have grown in a birch growth protected by nature. Therefore I claim that in a given piece of land which has been burnt over allow the white birch to grow and the fir and spruce to take root in their proper time and in another piece of land adjoining set out the seeds and the seedlings and nature will advance her growth of spruce and fir very much more rapidly than the growth on the land adjoining and the lumber will be of some benefit. Where on the other hand the stunted or pasture growth is practically of no value. This leads me to the principal text of my argument which is "let nature take its course in the Province of New Brunswick, plant her own seeds and then let the Government assist nature by protecting the seeds that she has embedded in the soil by a system of

FOREST FIRE PROTECTION

I might say in reference to the protection of our forests from fire that our main trunk lines of railway have in the past few years interested themselves very extensively throughout the section with which I have been connected and have done everything in their power to clear up their roads by burning old sleepers, cutting bushes and burning them in the proper time. This cannot be said of some of the branch lines throughout the Province which you are all aware of. I am sure that one of the first steps that the Government should take would be to insist that these railways conform with the law in each and every particular by cleaning up their right of way and having all the modern improvements on their smoke-stacks that will prevent the throwing of fire into the adjoining land. This I think is a very important question and something that should not be neglected at all.

We will next come to the matter of telephone and telegraph lines. Where the country has been intersected in the past few years in even the very remote districts by these telephone and telegraph lines they have made a practice of cutting all the bushes that might interfere with their wires as well as any that might interfere with their setting of poles. This brush is allowed to remain along the highways and where there is generally an elevation on the banks they dry very rapidly and make a good tinder for people driving along and throwing away cigars and matches. These companies

should be forced to take this brush out and burn it or put it in piles in a place free from danger where they can burn it in a suitable season, and I think that you will agree with me, that this is a matter that should be attended to in the very near future.

Now the Surveyor-General has asked me to give you an idea of the system which I have inaugurated throughout the district over which I have control. And perhaps it may be of some benefit and I feel, although this system has not been at all perfected to any great extent, it has worked out to considerable benefit, as in the past few years throughout a very large portion of this province I can say with the assistance of a number of men who have met me half way in all matters pertaining to the protection of the forests that I have had no fires that have not been under control within twenty-four hours, with one or two exceptions. And even in these exceptions we were able to get control of within three days.

Now to give you an idea of the system of which I speak I might call your attention to section 12 of the Forest Fire Act, which reads as follows:

"Whenever any forest, woodlands or barren shall be on fire it shall be the duty of the supervisor of roads, commissioner of highways, county councillors and constables near where such fire is and each and everyone of them on such fire coming to their notice to order so many of the men living or residing in the neighbourhood of the place where such fire shall be as they shall severally deem necessary to proceed to the site of such fire and their aid in stopping the progress of the same, and any of the above named persons refusing or neglecting to give such order and any person so ordered refusing to obey the same shall be liable to a penalty of not less than Five Dollars nor more than Twenty Dollars."

Now I may say that in the first place I was enabled through the courtesy of the Deputy Surveyor General to have some forms of notice printed embodying the provision of the Act relating to forest fires and these notices were forwarded to the different road masters, constables and county councillors through my district. During the winter visiting the different lumber camps I have continually made it a practice to post the men in the law relating to fires, and have instructed them as fully as I could in what action to take. For instance I took it upon myself to inform these men that in case of any fire starting in the vicinity in which they lived and should they think that they should not have sufficient help to at once get control of the fire that

they were to use their own teams and get to the nearest telephone office as soon as they could and communicate the case to me and as soon as I arrived on the ground I would fully re-imburse them for the use of their teams and their trouble and would at once bring sufficient men with me to get control of any fire that might take place as I said in their vicinity.

I might say in reference to this that notwithstanding that a good many men have used their own teams and spent considerable time in getting word to me of fires near them, that in all cases without any exception where I have tendered these men pay for their teams, they have one and all refused to accept one cent.

This shows at once that where there is a head to an organization of this kind the people one and all are only too willing to assist in any way within their power.

Now in years past when I was in control of a large tract of granted land I was forced to move men by teams and rail, and, when large fires take place in the interior of the province, it is impossible to obtain men to fight fires in the near vicinity for the reason that before you could get them together the fire would have gotten beyond control, and I have always found it necessary to go to the centres of population, such as the towns for a crew of men.

I have not had occasion in the past two years to take any action of this kind for the Government, but I might say that I have mentioned the fact to Mr. Downie, general superintendent of the C. P. R., and explained to him that the occasion might arise at any time and I thought that he should assist us in transporting these men to the scene of the fire free of charge. I might say that Mr. Downie met my views in every particular, and as my section covers nearly the entire route of his road, he has promised to move men as I suggested as soon as hearing from me. This again would show the public spirit that is instilled even in our railway managers in reference to fire protection.

Again I think the Government should arrange with the telephone and telegraph companies (who themselves would be benefited very materially by any system of fire protection) to transmit any messages relating to fires whenever the deputy fire wardens should be necessitated to use their lines, and I think it would work out beneficially not only to the lumbermen, but for the companies as well in a great saving of poles which are very often

burnt by fires causing a stoppage of business and loss of time in putting these poles back.

Now I think if the Government would make it an object for the sealers throughout the province to take charge of their different districts and inaugurate a system similar to the one that I have used as I have stated to you, I feel sure that in their capacity as fire wardens during the summer they would have considerable interest in the work, and acting as deputy fire wardens they would have control of their districts and be in a position to order men on any fires that might take place, and should they fear that the fires were getting beyond their control, they should be enabled to call in the assistance of the deputy fire warden in the adjoining district.

In an organization of this kind there should be some provincial head who would keep in touch with the sealers as deputy fire wardens, and the sealers themselves should see that the different officials throughout the county such as road-masters and constables should comply with the Act as in section 12. And I feel sure that where a system of this kind would be inaugurated it would have a great deal better effect than any system of forest rangers. For this reason: Our province is intersected by a great many settlements which have been distributed over nearly all of it and were several men interested and ready to take action at any moment in these outlying districts, I am sure that they would be in a better position to discover fires than any one forest ranger in any given district appointed by the Government who might be walking on one side of a hill through the woods and a half a mile distant on the other side of the hill, with the wind blowing away from him a fire might be raging, and he, the ranger, know nothing about it.

This is a thought which, if carefully looked into, you can see is very plain, that is, that it would be impossible for the Government to appoint a sufficient number of forest rangers so as to work out beneficially for the reason that they can only see over a certain amount of territory at one time, while our settlements practically cover the whole of the province by eyesight.

I might say in connection with the above that I have arranged with the lumbermen throughout my territory where they have men in the woods in the spring months looking after their camps, supplies, and so forth, that may have been left over, to have these men notify the lumbermen whenever they saw any indications of fire, and I have requested that the different

operators at all times as they get word of fire of any consequence to notify me at once by wire or telephone.

CUTTING OF LUMBER

In reference to the regulations made by the Provincial Government as to the cutting of lumber, the regulations more especially affect the cutting of undersized lumber, but have very little to say as to how this lumber shall be cut. For instance, we would say that our regulations call for an 18 ft. 10 in. log, and in most cases, where the licensee has to pay the stumpage, they do not think, where the lumber is of a large growth, it is advisable to run the tree up any farther than the 10 inches. This has a tendency to leave a very large amount of lumber in the woods, and I think that the regulations should read that all logs should be in future run up to 8 inches, but nothing cut under what would make an 18 ft. 10 in., which in a fair growth, should make a log from 38 ft. to 39 ft. 8 in. I think, if a regulation such as this could be carried out, the Government would receive a larger amount of stumpage and this would in a very great extent protect our forests from fire from the amount of tops left in the woods.

Tops

Again, in falling the tree the larger limbs at the trunk hold the top of the tree up from the ground, when after the tree is topped out the main part of the tree drops down and is hauled away. This leaves the trunk suspended on its branches, sometimes six feet in the air, or anyway sufficient air space underneath to allow a free access of air to permit this top to become thoroughly dried and which will burn very readily. Instead of leaving this top in this condition, if it could possibly be arranged, not only by those that cut on the government lands, but by operators who are cutting on their own grounds. If an understanding could be had with the different parties mentioned above that, after taking the tree out of the woods before the chopper leaves that part of the tree, he would be ordered to cut all of the lower limbs off the top, allowing the top to drop unto the ground, and again, if it could possibly be arranged so that these choppers would knock off a few of the top limbs, allowing them also to drop to the ground, leaving nothing in the air, it would have the tendency to very quickly rot these tops off and assist very materially in forming a forest mulch for the young sprouts. You can readily understand the point I am trying to make, that is, if all the tops were lowered to the ground so that the action of the weather would assist ma-

terially in rotting them out, they would not only assist in the forest growth but, to a very, very great extent, would prevent the danger of forest fire and aid materially again in preventing the early thawing of the snow in the spring of the year, for a year or two, after which time the young sprout coming along, would then protect the snow themselves. This is a thought which I have had in mind for some time and I think that the longer you think it over the more practical you will see it to be and the better opinion you will have of the point that I have made herein. You can see the object in preventing the early thawing of the snow in the spring of the year one year after the logging operation has taken place, preventing floods and retaining sufficient water power through the summer. This could be gone into very extensively and I feel that it is a point which is really worthy of consideration.

The Premier read a letter from Filibert Roth, Esq., Michigan Forestry Commission, regretting his absence and containing remarks on the subject of Forestry.

W. P. FLEWELLING,

Fredericton, N. B.

DEAR SIR,—

My sincere thanks for your kind invitation to the Forestry Convention and also for the copy of your Forest Act.

I regret very much that I cannot come as I am to be in Milwaukee the 20th.

Your Forest Act is very good and surely will lead to good results. While I am not sufficiently acquainted with your woods and conditions to venture any definite suggestions, you may perhaps be interested in some of our experience here in Michigan, as being helpful in shaping plans, at least in their general features for any district. Allow me to state a few, categorically.

1. For 70 years the lumber industry of Michigan has been important to this State. All this time we tried to save money by not spending any on fire protection. We have lost and lost heavily. The fires of 1881 alone

destroyed enough value in merchantable timber and other saleable property, so that if this money were out at 4% interest it would pay for a very fair fire protection from the interest alone. We have cut much timber and yet there is a general belief here among timber men that the fire ate up three times as much merchantable material as was utilized.

In addition, the fire *destroyed the forests, the young growth, the log timber of the future and in this it really did the greatest hurt.*

The Michigan forest, aside from the merchantable stuff, had a potential value, which today is easily \$50.00 per acre and this the fire destroyed and our people suffered the loss.

In 1907 we *at last* passed a forest fire law, framed like that of Minnesota, provides for fire wardens, pays nothing for *preventing* fire and pays only for *fighting* fire and limits the yearly expense in a township (36 square miles) to \$50.00, of this law the State Land Commissioner, who is to execute it, says: "It is not worth the paper that it is written on."

It puts a premium on having fires and the limit of \$50.00 expenses, acts in forest fires exactly as if the chief of a fire department in a city were told: "Hurry and fight the fire, but when you have expended \$24.00 you better quit, pick up your equipment and go home."

"A fundamental principle in this matter of protection is the same in all forest fire countries. We have learned two things.

(a) We should prevent fires by an active patrol, who can also serve to patrol against trespass and game law violation. Part of this patrol is needed only a few months in each year, but each district should have one permanent man.

(b) The expenses should be in keeping with the importance of the enterprise. No civilized land can afford to allow its forests to burn up. We have learned that the time when we should have spent our money freely was right at the start. Only by a strong, well planned and persistent effort can we overcome the *normal* as well as the *physical* obstacles. Once we are on the right path, the matter will be as easy as it is in the Old World, where these things have been done for centuries. No district should spend less than 2 cents per acre for protection alone.

2. From the inception of our Public Affairs we worked in the direction

of having all lands placed in private hands. We now know that we made a mistake in the care of forest lands, or all lands only doubtfully suited to agriculture. For over 30 years the State of Michigan has had from 15 to 25% of its land area "in soak for taxes." These tax lands have cost us millions of dollars to advertise and try to get into private hands and all expense has been in vain; we have them still. Our experience merely confirms that of Europe which has declared that the *State* is the *best* forest owner, and in case of poor soils, is the only good proprietor, for it is only the State who can afford to carry out the long time plans needed to keep such lands from becoming waste. We want State forests here and we are working to get them.

3. A large part of all our trouble and loss is due to the fact that we never decided on any definite policy beyond the mere "Get rid of the lands." Just as a farmer decides on what he wants to do with his lands, so the State should have a well matured plan and work accordingly. We, here, are discussing now such a plan and policy.

4. The State of Michigan as such and also many individual owners of large holdings have suffered (and the woods with them) on account of long lived contracts or interests given to people to exploit the forest. We, here, fully realize that the time is passed when such contract should be given to anybody and that forests can be utilized and the timber be sold and removed without such contracts.

In every case the exploiting interest protest step by step against any innovation and the whole treatment of the forest is based on a series of compromises in which the forest gets the worst end of the bargain.

Our little State Reserve where we are now selling the fire-killed material of cedar and pine, the main question is never: Is the price right, is the scale right, it is always: Will it effect the forest growth favorably or unfavorably? and we believe that this should be the only deciding question and all others should be held secondary, whenever the state handles a forest.

We, here, in Michigan have lost much in forest wealth and time and land because the men who have handled our State forest lands and private lands could never "See the woods on account of the trees;" they could see only merchantable timber and the forest never meant anything to them beyond just so and so many million feet of timber or logs. They were able men, our Michigan lumbermen, they knew timber and knew how to log; they

set the pace in lumbering for all the United States, but they never knew the forest as a *field of growing crops*. Their love and interest stopped at the log and the small white pine was mere "brush" and of no value.

This attitude has lost us millions of dollars and is one of the great causes why we *import* our better class of timber today, whereas fifteen years ago, we were among the greatest export States of the World. We have learned our lesson, we now know that the man who is to *care for* the forest, must be trained, not as a *logger*, but as a *farmer*; he must love the young tree, know the seed and the seedling and delight in its care and its growth. But this kind of training he does not get in the lumber camp, he gets it at a school where the forest is treated, is spoken of and read about as a growing crop; where a man's duty with regard to the forest is not summed up in "cheap logging" but in "proper care," and where the very atmosphere of the place tells him of the *Tree as a living being* of the utmost importance to man and as being worthy of man's best efforts.

We, here, believe that it is not necessary to load great administrative burdens on a young graduate of a Forestry School, nor turn to an inexperienced man large properties without council and safeguard of older experienced heads; but we do also believe that not a single tree should be cut until a man has marked it who loves the tree as a living being, rather than as a pile of logs.

The *logger* has laid millions of acres of our lands waste, we look to the Forester to rebuild the forest and reclaim these lands and make them productive.

With my sincere good wishes for the work of your Convention, believe me,

Sincerely Yours,

ROTH

The Premier read a paper by Mr. John Robinson, Jr., subject: "Forest Fire Ranging."

HON. F. J. SWEENEY,
Moncton, N. B.

DEAR SIR,

I regret very much that I cannot be present to take part in the Forestry

Convention to be held in Fredericton on the 20th and 21st of the present month.

I am sure you will have a very representative gathering.

The object of the Convention being for the preservation and better protection of our forest lands should appeal to every citizen. The Government should be loyally supported in their efforts to preserve this, our most valuable asset. Judging from the list of speakers to be present, the discussion will be both interesting and instructive. I understand that experts in Forestry will be present from the United States and Canada. I presume it is the intention of the meeting to discuss and adopt the best methods of forest fire protection. This subject should be given very serious consideration. Fire has been the great enemy of our forests. Of course man, the natural enemy of nature's most beautiful gifts, is also largely responsible for the many forest fires that have occurred in our Province within the last five years. From my own personal knowledge I say that a large percentage of the fires are started through carelessness and very often by persons who should use every means to protect our lumber lands. Lack of interest on the part of our lumber operators and carelessness on the part of the foreman in charge of lumbering drives are responsible for some of the fires that occur. Men leaving the drive in the month of May, the most dangerous time of the year, very often boil the kettle on the side of the portage road, get up and walk away and never think of extinguishing the fire.

Cruising parties are some times careless, fishing and hunting parties have been known to start fires that have destroyed valuable timber limits. I know of one instance where a fire was started by lightning last August. This occurred on the Lake, near Little South West. The tree was struck and splintered by the lightning. It was a long hardwood tree and burned slowly and fell across the Portage Road. The fire was just getting into the dry brushwood when two men, Benjamin Stewart and Fred Hohnes came along. These men are employed by D. & J. Ritchie & Co., and were on their way to one of the firm's bear houses, and were just in time to stop the progress of what would have been a most disastrous fire; it being a black spruce country and well wooded. Considerable odd works for a fire get well under way in such a country as that it would be impossible to stop its progress.

We have the disease, now what is the cure? The first consideration is to organize a proper patrol system. Appoint competent men who will de-

vote their time to the work, must be good woodsmen, men of character. Each officer to give a bond for the faithful performance of his work, must keep a diary of his work and take the name of every man he meets on the Portage road or on the streams, also find out what his business is in the woods and what section of the country he or they are going to, make a note of same, send in his report every week. Should be paid a salary that would allow officer to devote all his time to the district under his care.

Two men to have a district, the Government to pay one officer, the lumber operator holding lands in that district to pay one man. Both men to be sworn and subject to the Crown Land Department. Forms to be furnished by department for wardens to keep record of their work.

Road Commissioners should be obliged to burn brush and all other rubbish when skirting roads in country districts. This could be piled on road and burnt at night with perfect safety. Telephone Companies should be made to do the same and not throw the refuse back in the edge of the woods to dry and become dangerous. Now is the time before any more damage is done. (The above can be avoided).

You ask me to prove that a patrol system would be effective. I can give my own personal experience.

August 10th, 1905, at 8 p. m., I was notified by T. Lynch, Esq., that a forest fire was started at the old Post House on Little Dungarvon. On the morning of the 11th, I reached Boiestown, picked up eleven men purchased supplies and by nine p. m. was at the fire. Leaving Mr. Daniel Lynch and Fire Warden Price in charge, I went out for more assistance and returned next day. All told we had fifteen men and by working late at night and early in the morning for seven days we controlled the fire to about 100 acres in a black spruce country. The fact that I was notified in time, I acted promptly and received most valuable assistance from Mr. Daniel Lynch and Douglas Price we prevented the fire getting out of the valley of the Dungarvon.

I will give you another instance of what the patrol system would accomplish.

June 15th, 1906, Douglas Price discovered a heavy smoke rising north of the C. E. Railway at Ludlow. Price started at once and located the fire on a block of Crown Land under lease to W. R. McCloskey.

As Price was acting in the capacity of fire warden at the time, he ordered out a crew of men; they worked mostly all night and succeeded in killing out the fire. It just cost the department \$19.50. The fact that Warden Price had the ability and acted promptly, saved a valuable country. Messrs. Lynch, Gilson and McCloskey are the lessees of the lumber lands in that locality and know its value as a spruce country. I could name a number of others but it is not necessary.

I will now describe the big Dugaryon fire of 1906, August 15th. I was at Bathurst and received a telegram from the Miramichi Lumber Co., "Forest Fire north of Bodestown." I arrived in Bodestown, on the morning of the 16th. The smoke could be seen from the store door of the company, yet no one could tell me where the fire was, for the firm received notice through a messenger on the 12th or 13th from Pleasant Ridge, that a fire was raging in the vicinity of the Big Dugaryon. I was obliged to hunt up two men to locate the fire, consequently we did not get a crew to work until the evening of the 19th, giving the fire a full week of a start. Now if the firm had taken interest enough to send at once and locate the fire, so we could have started on the 16th with a crew of ten, possibly we could have controlled the fire in the valley of the Dugaryon. I don't say we could have done so, but it was possible. When the two men reached the fire on the afternoon of the 17th it was just working over the mountains. We had altogether about 85 men in the woods, including men sent by Mr. James Robinson.

The method we used was digging trenches where the ground was dry and composed of turf. It was necessary to swamp and cut through the roots, making a perfectly clear trench, so that when the fire lapped up, it could not cross the trench. We used axes, picks and shovels; we used water, where we could get it, but at that season it was very scarce. On some of the ridges where the soil is sand or gravel, it is only necessary to dig up and throw on the earth, but in ground composed of turf it is necessary to cut through to the gravel. We came across two beaver ponds that proved valuable to us in lighting the fire. I make the above statement to prove if we had men patrolling the country at the time the above fire started, prompt action could have been taken and a good property saved.

While we succeeded in saving Little Dugaryon and Bonous River, Big Dugaryon and Hamford Brook suffered. The burned district is under lease to the Miramichi Lumber Company.

The protection of the beaver is certainly a move in the right direction and should be continued, their dams reserved a large supply of water, which is most valuable in dry season.

I would also suggest that the forest at the head of streams be reserved, as the snow and ice would be protected late in the spring and would keep up a better supply of water.

It has been asserted that a fire cannot be controlled in the forest when started in June. We had a very bad fire in Blackville started 13th June, 1906.

Mr. Bernard McCormack of Blackville, and Mr. McKendrick, manager for Messrs. Gibson & Co., will be present at the convention. I would like you to call on them for their opinion of the manner in which the above fire was got under control.

I trust the convention will be successful. Premier Tweedie and Surveyor General should be remembered. I am sure the people appreciate the great interest you have both taken in this matter.

Your obedient servant,

(Signed)

JOHN ROBINSON,

Chief Forest Ranger.

RESOLUTIONS

MR. W. B. SNOWBALL I have a resolution which my committee wishes to present in reference to matters which the committee wishes to bring before the convention.

As to the paper by Mr. Jones, Chancellor of the University of New Brunswick, in regard to practical and theoretical instruction along the lines proposed in the University:

We believe, as a committee composed of lumbermen, that such an education is a necessity to the Province to conserve and advance our interests; also we believe that competent people, such as those who are instructors now

in the Province might go through the Province and give forestry instruction concerning some thing more than they at present know in reference to the subject.

Resolution presented, seconded by Mr. David Buckley :

Whereas, there is not at present a institution in our Province providing a Forestry course ; and

Whereas, practical men are required, trained in theoretical and practical knowledge, to conserve our forest wealth,

Therefore resolved, that this Convention recommend the Government to assist the University of New Brunswick to provide such a course as outlined by Chancellor Jones and also that the Government provide Forestry instructors to give short courses throughout the Province of say 90 days in each district, on the same principle as the Dairy School instructors.

DR. G. U. HAY—There is simply a suggestion or two I wish to make. In common with all who heard Chancellor Jones yesterday in the syllabus put out, I confess I was very much taken with that. I think we should have that subject in connection with our University of New Brunswick, and the paper we heard this afternoon from Mr. Cary called attention to the fact that we should have efficient and educated men to carry out Forestry regulations in this Province.

In the Yale Forestry School there is an important example to us perhaps and that is this: Mr. Pinchaud, I think, made an endowment of a quarter of a million dollars to establish that, and then the lumbermen of Connecticut asked for an especial course for lumbermen who were to go in, exactly similar to what is proposed by Chancellor Jones, and the Yale University said: If you will pay for this we will be very glad to let you have it, and the lumbermen after consideration said that they would make an endowment of \$150,000 for that special course. Now we all know that any man who was brought up among trees is a generous man and I think the lumbermen of New Brunswick are not less generous than the lumbermen of Connecticut or any other State, and I think the fact may be left with them. We do not want to send any man away to the Forestry School at Yale or Harvard or Michigan if we can possibly help it, because they are generally taken up there and we lose their services. Here perhaps is a practical way. We all know that perhaps the Government is spending as much money as it

can upon the provincial University and the lumbermen of this Province are a pretty substantial lot of men and if they would come forward perhaps and do something like that it would be heartily received.

Resolution passed unanimously.

MR. J. FRASER GREGORY—As Convener of the Lumbermen's Committee, I want to express to you sir, as Premier, and to the members of the Executive, the hearty appreciation they feel in reference to the calling of this Convention, and congratulate the Government of the success that it has been.

This morning the manager of a pulp mill in speaking of the lumber business said that the pulp industry was a splendid industry for the laboring man and give us the money expended in it. I think it is also a splendid business for pulp mill managers, also for lawyers, but there is one poor fellow that has not had anything in it at all and that is the stockholder, as far as this province is concerned the stockholders in this province have not got anything back.

The Resolution is as follows:

Inasmuch as the Survey and Expectation of Lumber Act as now on the Statute Books is antiquated and not applicable to the present conditions and methods of carrying on the lumber business.

Therefore resolved, that in the opinion of this convention a new Act should be prepared without delay and suggest it would be best to appoint a commission for the purpose.

Moved by Mr. J. Fraser Gregory, seconded by Mr. Allen Ritchie, and carried.

Mr. Randolph moves the following resolution:

Inasmuch as in the opinion of your committee, there is at the present time no adequate system of fire protection for Crown Lands in the Province of New Brunswick.

Therefore resolved, that the Government be requested to take prompt action towards the establishment of organized fire protection, so that the same may be in operation by May 1st next.

MR. HUTCHESON— In seconding the motion, let me say in regard to fire protection, the object to be arrived at and desired by this convention and by everyone interested in the manufacture and use of lumber is, how can we protect from destruction by fire.

I think it is safe to say about half the area of lumber lands in the Province, or generally classed as forest land, that about the half of it has been destroyed by forest fires.

In regard to the section of Northumberland County on the Cain River, there is no less than 300 square miles burned over in a square block district; on the north branch of the Renous River, some 25 years ago a fire took place and in the one block there is about 20 miles; the north branch of the Portage Road comes through about five miles of burnt land. On the Dungarvon in that county there was a fire took place this year that burned I think 25 miles, as a fair estimate of the quantity destroyed. On the south branch of the Renous, in the well watered section, there were three fires started there last year and they burned a large section; but on those three branches of the Miramichi within my recollection, there have been burned at least between four and five hundred square miles of land.

And the land at the head of the Northwest and at the head of the north branch of the Southwest Miramichi is practically all burned land, all except the intervals and the highlands where the ground was moist; but all the highlands, what we call Bald Mountain, they are all bald, there is nothing on them.

I am told on the Restigouche there was a very large amount of land burned and the country is in a few years utterly destroyed. I have myself cut logs that were partly burned and they gave me only about fourth quality logs, because between the June fire and the time they were cut the worms had practically destroyed them.

In the last few years destroying between four and five hundred miles in districts I have been over I feel in the next 25 years perhaps if we are not a little more careful than we have been it will make little difference to us about this fire protection at all.

The most important business of the Province I don't think is Forestry, the most important is agriculture. When any of this forest land is pronounced suitable for settlement and agriculture I am quite willing that the

agriculture should have it, because I think the profit to be derived and the people to be supported by it are much more to the acreage than by Forestry. But I think the most important thing for this convention to consider is the protection from fire. I do not consider the protection from fire is ample. Some fire wardens have been appointed and so far as I have observed they have done their very best, but the time to prevent the fire is to fight it and put it out. I have had some experience and have been fairly fortunate, though I have met some losses; but my experience in any fires which have occurred in any lands in which I have been interested is that no fire warden or no body of men could ever put them out. They burned till they went out, till the rain came and put them out. I have sent men to put out fires and they would say: "Just as soon as the wind has changed and we can get around and there is a little fall of rain we will put them out;" then comes a dry spell and the stumps catch and they burn themselves out.

If you go around the Dungarvon district you will find the fire burned down to the edges of the stream, burned down to it and did not cross. My experience is, prevent the fire, don't put it out. You can't put it out. Take a forest fire a mile or a half a mile from water, what can you do? You can't go in front with a wind blowing, you would lose your life. What you have to do, and do it very quickly, is to instruct fire wardens to keep poachers out of the woods. That is where the fires come from—people not legitimately in the woods, but people who come illegitimately, and you or I may tell them they are private lands, they simply tell you it is none of your business. My idea is to put fire wardens in and if they catch any one in there without liberty they should be punished. The Dungarvon fire, it is well known, was started by men who were there spearing and catching salmon contrary to law. My idea is that to prevent the fires in the dry season the proper way is to keep people out of the woods unless they have business there.

MR. CRCHILL—Is there any provision in the Road Act to arrange for burned wood and rubbish. I remember where a road was cleared of the undergrowth and that was allowed to remain on the road through the entire summer, and a very dry season, and during the latter part of the season the lighted butt of a cigar would have set the place in a blaze, and if there is nothing in the present law to compel commissioners to burn the undergrowth and brush along the edge of the roads the Act should be amended in that respect.

MR. F. W. SUMNER—Could the guides of the present time be appointed fire wardens?

THE PREMIER—By law they are.

MR. F. W. SUMNER—It would seem to me in a mild way I would suggest that special instructions be given to the guides. I have information through a letter, since coming here, that a guide with sportsmen on some of my land started a fire which burned quite a piece of land. The great proportion of hunters who go into the woods, I believe, really feel it would be disastrous to start fires, but there are men who go in as hunters who do not care, and for this reason I feel the guides should have very strict instructions.

Then I think it would be well to have a Board of Investigation and that every fire that occurs in the woods should be investigated down to the point. It may be expensive, but a year or two of that I believe, would be productive of good results. I think there has never been the trouble taken to find out how fires started and I believe if it was, and the people all through the country knew it, they would be more careful and bring responsibility on the people who started them, and I would suggest it would be well to have an investigating committee to investigate every fire, how it started and who started it, to find out under oath.

I believe this meeting will be for good and I think it would be well to go through the back settlements and give people copies of the laws in respect to fires. The people do not seem yet to be alive to the fact that they should not start fires.

MR. FLEMING—What method has been adopted for the distribution of these printed notices containing the section of the Act in relation to forest fires? Going up and down the country, I think, only once have I seen this notice posted up in a public place. It seems to me it would be a very good thing if there was some system adopted for having this notice put up just the same as the Game Law—posted in a conspicuous place in the different parishes throughout the country.

THE PREMIER—The practice is to send notices, printed on cotton, so as to be durable, to send them to the game wardens and sealers of lumber, and very often Peensees of lumber lands, who are careful, get a lot of them. I have seen them get two or three hundred and post them wherever there were public roads leading to their lands.

The Maritime Sulphite Fibre lands notices were all around. The manager of the Rank of Montreal was very careful to have these notices

posted up at regular intervals wherever any one would be likely to travel and I think the notices have a good effect.

Resolution carried.

MR. ANDERSON With reference to the exportation of pulpwood and as being interested in pulpwood, we have viewed with considerable apprehension, first, the cutting of so much small wood, and in the next place we think if the Government is willing to allow small wood to be cut, as I believe it is generally stated to be cut throughout the Province, that if they are determined to cut it we should at least have it manufactured in the Province, because the cost of the labor that is put on the production of the wood itself is small in comparison to what it is when manufactured in the Province, and I think I heard it stated here this morning that there was something like an equivalent to ten dollars an acre, and if that is so I think it is greatly in the interests of our country and to the interests of the future of our country, that we should take this matter in hand before it gets to such a size that it is impossible to handle.

I therefore take great pleasure in moving this resolution :

Inasmuch as this Convention is called to devise methods of conserving our forests for posterity, so as to be a source of income for all time to come ;

And whereas, at the present time large quantities of logs and pulpwood are being exported to foreign countries for manufacture there instead of within the Province, which practice is destructive to the forest and without due compensation to the population ;

Therefore resolved, that in the opinion of this Convention the export of saw logs and pulpwood cut from Crown Lands should be prohibited.

THE PREMIER I think I would suggest that it should be prohibited by the Federal Government, as this resolution would seem to assume the Provincial Legislature had the power.

MR. HAZEN We should apply it to the Crown Lands.

MR. HUTCHISON I understood when that resolution was framed it was entirely to refer to pulpwood exports, it was entirely to refer to pulpwood cut on Crown Lands for exportation.

From the statement of the Premier I take it that there are six million acres of Crown Lands now under lease, and according to the terms of the Crown Land returns of last year I think there are about 136 million feet cut, which would mean we are actually cutting on our Crown Lands about a log to every 24 acres, or 23 superficial feet to the acre. The fact of such a very small cut shows, I contend, that we are not keeping up with the times, that the lumber industry is not keeping pace with other industries. Our lands should yield at least one log to an acre, so a log in conformity with the smallest log allowed under the Crown Land regulations would be 18 feet 10 inches, which is equal to 72 superficial feet, and if that is cut to the acre it will leave a cut in this Province on our Crown timber lands of 432 million, which would net to this Province in stumpage \$540,000, a gain of \$369,000, in addition to the revenue. If the sawmill will not keep up the pace I would strongly suggest that we now allow the pulp people to come in.

THE PREMIER—Take the Miramichi Lumber Company; they have 166,000 acres of land they are cutting lumber on and well covered and we could not prevent that. That would have to be done by the Federal Government. It is not an export duty we should put on but an increased stumpage should be had on the manufactured logs going out of the country, on the Crown Lands.

MR. ANDERSON—With the permission of the Members, I will suggest that as that was the intention to have it read, "On the Crown lands" and as we well know the Local Government has no power to put an exportation duty on the Federal Lands, therefore I move that it be changed to apply to Crown Lands.

MR. F. W. SUMNER—The Government do hold lands today that I maintain that after listening to the different members of the Convention and experts in this line that really require that done.

I am interested in some districts, but many that I am not interested in, and it would not cost me a thought if they would stop the cutting of it over; but certain districts were burned over in 1825 on the Miramichi. There is a great quantity of small spruce running from three to four, five, six and seven inches growing about as thick as it can stand and the roots appear to be interlaced, and it grows to probably three or four inches at the top, very limby and then seems to get mossy, say 25 or 30 feet high and by and by a wind storm blows it over.

I have thought a great deal about this and from the information I can glean I believe the only way to manage that would be to cut two thirds of the land out. The trees grow so closely together they debar the wind and sunlight from getting through and they reach their growth and begin to decay and gather moss and then gradually blow over.

For this reason I think it would be well to consider this question carefully before considering prohibitory ideas of exporting pulpwood. There is a great deal of country that requires this cutting. Cutting pulpwood timber would be of great value in the way of increasing its growth.

Then again, take up the conditions under which this Miramichi Pulp and Lumber Company come into this country and I think the Government ought to give great consideration to any company who invest the money they did in the business before putting stumbling-blocks in their way. I believe that eventually the Government will legislate that this wood must be made into pulp in this country and then strengthen it by saying it must be made into paper; but it would cut off a lot of labor and capital that have been invested to stop it at present and the conditions would be hard on some people. I feel it is a question we should not vote on without due consideration and that it should have further consideration at this Convention before the Members vote for that resolution.

MR. ANDERSON We do not wish to prohibit the cutting of pulpwood by that resolution. Those are only my own personal remarks, and we have brought the resolution before this Convention to invite discussion.

THE PREMIER You say if A owns 100 or 200 acres of land and B was a licensee of a mile of land from the Crown that A could send his pulpwood to the States to be manufactured and B could not. It would be fair if the Dominion would pass a general law; but the farmer under that could send and the man on Crown Land under this provision, could not do it. It should be done by the Dominion.

McAdam Junction,
Feb. 15th, 1907

MR. W. P. FLEWELLING,
Deputy Surveyor General,

DEAR SIR, —

I regret to have to write that my duties at Sackville will prevent me attending the sessions of the Forestry Convention. I am deeply interested in the subject and am glad to see that such a step is being taken to create public interest in this vital national question, and to perfect and give greater effect to the "Forestry Law," which, beginning in Westmorland has become provincial.

One subject, I notice, is not in your list, viz.: the farmers' interest in Forestry. The pioneer settlers in this country who had with immense labor to hew places for themselves out of the forest came to look upon the trees as their natural enemies, and this seems to have become an inbred instinct in many of their descendents. Trees are destroyed, even where they are doing no harm and where their destruction yields no profit to the destroyer. It would be a great thing if public sentiment could be so cultivated that every farmer would have his wood lot religiously cared for and protected, and if the farmers could be made to see the value of wind breaks in adding to the beauty and the profit of their farms.

The experience of the Northwest has shown that every foot of height in a wind break protects 50 feet of crop. A wind break of trees six feet or ten feet in width more than pays for itself in the following ways:

It prevents the rough thrashing of the crop by high winds which draws upon the vitality of the plants and therefore results in less crops, it tends to prevent lodging of heavy grain crops, it protects grass roots by keeping a deeper covering of snow on the land and add fertility by the ammonia and carbonic acid (through its solvent power) and nitrates condensed in the snow. It holds the heat of the sun and reduces very greatly the powerful chilling effect produced by the rapid evaporation of moisture in a wind. The warmth over a piece of land between two wind breaks is so much greater during the latter part of the day and is held over the land so much longer during the night that it is equivalent to moving the farm several degrees

further south. Early and late frosts do not effect such plots so readily. It is only a few feet on their northern sides which is injured by the presence of the trees and these few feet are generally needed for a common road along the field. All large fields should be surrounded by such wind breaks. Further advantages are the following: These wind breaks, with care, can be made to supply a portion of the fire wood for a household and to do this perpetually. As we have come to the days of the wire fence the trees may be used as indestructible fence posts without injury to the trees and this as a practice would reduce the enormous tax on the farm or community fund in the keeping up of the wooden fences of our farms. Corn, tomatoes and apples can be successfully grown in many portions of the Province where the farms are blanketed by tree belts, as witness the noted success with the protected orchard at the Experimental Farm at Nappan as compared with the indifferent success of the exposed orchard. One experiment like this shows that all crops could be better grown in such conditions of shelter. Had we an aesthetic population the added picturesqueness of our farming sections would be regarded as sufficient reward for any expense and trouble involved in inaugurating such a practice. In the case of fields which are being cleared it really means taking less trouble and being put to less expense in chopping fences, etc.

More should be made of Arbor Day in our schools, for the sake of doing what the Forestry laws have begun, namely, to create a public conscience as to the value of the tree. I should be in favor of an enactment which would place a fine upon any body of school trustees in the shape of a reduction of their Government grant who would not see that at least one tree was planted on or near the school grounds on Arbor Day, and who should allow one such tree to be injured by the schoolars. Such legislation might seem severe enough, but it would have a great awakening effect on schoolars, teachers and trustees.

In Mount Allison University this subject is introduced in several classes of the Arts Course, viz., Botany, General Chemistry and Organic Chemistry. We have had special lectures on the subject, notably a course of lectures on the methods of German Forestry, delivered by Mr. George Trueman, now of Riverside Consolidated School. And I am free to say this, as we occupy a central position in these Provinces, as soon as the means can be provided we are ready to add to our department of Applied Science a section devoted to Forestry, and if we can accomplish this through any public spirited men interested in the subject we shall feel that we are doing something to serve the best interests of our country.

There is another phase of this subject which may seem frivolous and far away to practical men, but which is of great importance nevertheless.

In the samples of the primeval atmosphere of the world, which we find locked up and preserved for us in the cavities of our oldest rocks, we find nitrogen, hydrogen, carbonic acid gas and some others, but no oxygen. The world therefore began with no free oxygen, but with plenty of carbonic acid gas. The only agent known in nature which can free oxygen from the grasp of carbon is green matter in plants under the action of the sunlight. The oxygen of our atmosphere is therefore a gift to the animal world from the plant world.

Lord Kelvin, in an address before the British Association for the advancement of science, said that taking the amount of coal in the known coal areas of the world, there is found to be not enough free oxygen in the world to burn the coal. We are therefore in greater danger of an oxygen famine than of a coal famine.

By the respiration of men and animals and the furnaces of our factories, we are using up the free oxygen to an ever increasing rate. It is important, therefore, that as the forest is the only strong growth, which can be produced in some rocky areas, that these areas should not be allowed to lose their forest growth and then in consequence their soil. Vigorous vegetation in every possible place is needed, not only to supply food and timber to the world but also oxygen, and only increased vigor of plant growth can we keep the balance in face of the increased use of oxygen.

If this can add anything to the discussion you may use it, though I have not written it with that in view.

I am very sorry I cannot be with you in what must prove a very interesting gathering.

Yours very truly,

(Signed) W. W. ANDREWS,

MCClellan School of Applied Science,
Mount Allison University.

MR. W. B. SNOWBALL— I feel like the Committee who proposed this Resolution, of which I was one, that it is a most important matter whether we should allow the raw material controlled by the Crown, or by the State, and which is the property of people, to go outside of the country to be manufactured.

We have the kindest feelings towards our American neighbors to the south and enjoy seeing them come amongst us to establish manufactories, but we want them to come to us and manufacture rather than our raw material should go to them for them to derive the greatest benefit from it. Within a few days we have noticed this matter discussed in our papers, showing the amount of pulpwood going out of the province, being manufactured into pulp and paper on the other side of the line and then sent back to us in that form.

I feel as a Canadian citizen and particularly as a New Brunswick man that we should keep within the bounds of our province all the manufacture we can, and even in connection with our sawmills, that we should examine more closely and find out what our lumber is put into, so that we can put the most labor on it in our own country and keep the labor right here. That is a matter every lumberman and millowner I think is looking to.

Reference has been made to the small quantity cut per acre, but from what I know of our timber limits I think we have kept fully up to the growth of our land and are unable to cut anything further without destorying or depleting the forests in which we are interested.

I am young in the business and do not know much about it as others, but that is my impression and what I have gained from experience and the views of those with a long connection with the forest business, and instead of increasing the output from the lands we hold, if we wish to conserve it we will have to change our milling operations so as to cut it into smaller sizes, give more labor to our people and keep our staff around us and still give more labor in the country than at the present time. Those are my views with regard to the pulp industry. With people who own private lands we cannot stop them, but I do not think for one moment that anyone interested who feels he has any land of importance is going to cut it off to any great extent for pulp purposes when he knows the value is increasing each year.

If the law goes through it should be watched closely to see that it is carried out. Crown Land lumber should not go outside of the province;

timber should be kept in the country, or if necessary bring it in, increase the population, increase profits to storekeepers and other people interested in the country.

I feel strongly on the motion and hope the convention may see the same as I do in connection with it and let it rest then with the Government whether they can see their way clear to pass such restrictions as we think should be put upon the Crown timber limits.

Resolution carried.

Convention adjourned sine die.

