CORRESPONDENCE

Letters are invited from our readers on matters of practical and timely interest to the trade or users. To secure insertion all communications must be accompanied with name and address of writer, not necessarily for publication. The publisher will not hold himself responsible for opinions of correspondents.

CANADIAN HARDWOOD LUMBER ASSOCIATION.

WOODSTOCK, ONT., February 16th, 1900.

EDITOR CANADA LUMBERMAN:

DEAR SIR,—Such an association as the above does not exist. The need of one was never more apparent than during the year 1899. The demand for hardwood lumber was such that anything that looked like lumber was put upon the market. There being no uniform system of inspection, more or less dissatisfaction took place between buyer and seller. An association composed of hardwood manufacturers and wholesale dealers could formulate and adopt such rules for inspection as would become general among all classes of dealers, and thereby obviate to a great extent any friction that might otherwise arise. In the United States they have an association called "The National Hardwood Lumber Association," which was organized April 8th, 1898, and in eighteen months had a membership of about four hundred of the prominent lumbermen from Boston, New York and Chicago, and some from all the East, West and Southern States, including four from Canada. At a meeting held in Memphis, Tennessee, last November, they adopted rules for inspection of hardwood lumber and the measurement of hardwood logs.

If Canadian lumbermen would organize and adopt similar rules for inspection, great good would certainly result to all parties concerned. Just now, before the new cut of lumber is put upon the market, would be a most opportune time to take united action on these lines.

I would be pleased to see an expression of opinion upon this subject from some of your many readers.

Yours truly,

O. G. ANDERSON.

IMPRESSIONS OF THE BRITISH MARKET.

(By a Recent Visitor.)

THE most important market for lumber in Great Britain is, of course, London, which not only supplies the trade in that city, but also the home counties and the south coast. There is a large scope for all kinds of Canadian logs and lumber, such as pine, spruce, oak, white ash, black ash, red birch, maple, etc. The principal business is in pine and spruce, but this trade appears to be a kind of monopoly, being in the hands of a small group who are fed by the middlemen exporters in Canada, the Quebec shippers, who buy and control the outputs of the saw mills in Canada.

I found a great many responsible firms in London who are anxious to get in direct communication with the saw mills in Canada. Frequently negotiations do not lead to business on account of the mutual want of confidence. The London buyers hesitate to buy lumber from unknown sources, and the small saw mills in Canada, not knowing the right people in Great Britain, show great distrust in direct dealings except for payments on the Canadian side against bills of lading. The Canadian middlemen, who understand the position on both sides, consequently step in and swallow up the bulk of the profits there are in the trade, and the Canadian saw mills simply work for the Canadian middlemen, at least in a great degree.

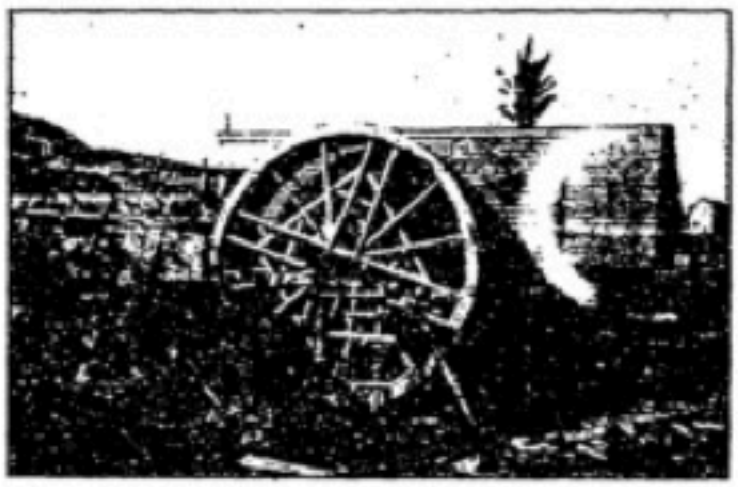
I found several highly respectable and responsible brokers in London and other large receiving ports, whose names I could give, and who can be trusted in every way. They are prepared to deal even as flat buyers, or sell at fixed prices to arrive, and even handle consignments, in which case they sell for the saw mills direct to consumers. In this way even the small saw mills are put in direct communication with the actual consumers and derive much of the benefit and a large proportion of the profits which are now taken by the numerous middlemen, through whom their lumber is now sent into the markets.

Consignments as a rule cannot be advocated, but on the other hand, if the right people handle consignments honestly, the result is obviously most favorable for the saw mills. In pine particularly I found that all grades except mill culls are saleable, but each grade ought to be honestly sorted and differently marked.

Regarding the measurement, I understand that the dock companies in Great Britain always measure, and their measurement accounts are undeniable evidence in the law-courts there and sellers as well as buyers always accept their statements. The dock companies are perfectly impartial.

Regarding dimension stuff, when the Canadian saw mills can put themselves in direct communication with the right parties on the other side, they will find there is a market for this material, particularly in the hardwoods, but I certainly think that the Canadian manufacturers ought to have agents in London, Liverpool Glasgow, etc., who would take proper care of their interests there. Such agents can be found who also guarantee the accounts in case the buyers should fail before the goods are paid for. To deal direct with the actual consumer is not advisable, as the saw mills ought to have somebody to guard their interests when disputes occur regarding quality, etc.

J. B. M.



A NEWFOUNDLAND SAW MILL.

BRITISH COLUMBIA LETTER.

(Correspondence of the CANADA LUMBERMAN.)

THE lumber and shingle manufacturers of this province met about one month ago and completed organization, under the name of the British Columbia Lumber and Shingle Manufacturers' Association. Mr. John Hendry, of the British Columbia Mills, Timber and Trading Co., was elected president; Mr. J. G. Scott, of the Pacific Coast Lumber Co., vice-president, and Mr. Wm. T. Stein, secretary-treasurer. The lumber and shingle mills in Vancouver and New Westminster have joined the association, and it is expected that in a very short time every large mill in the province will have followed suit. Under the proposed arrangements manufacturers expect that prices can be regulated as far as British Columbia is concerned so as to enable the mills to carry on business much more profitably than in the past, and to more equitably divide the business done. For instance, it has often happened that orders have had to be refused owing to a mill having charters to satisfy too far ahead. Owing to the friendly relations now established, it is claimed that the output will be regulated to some extent so that all the mills in the province will as far as practicable be made to share alike, according to their capacity, in all the business offered. Some time ago many of the lumber companies of British Columbia joined what is known as the North Pacific lumber combine, but this arrangement was found not to work satisfactorily. The combine was manipulated from Puget Sound, and it was very soon found that such an arrangement where American, as well as Canadian manufacturers, were concerned, was impossible, and the Canadians withdrew. Since then very low prices for lumber have prevailed.

The Victoria Lumber and Manufacturing Co. have just completed doubling the capacity of their saw mill at Chemainus, making it the largest in the province. Your correspondent now learns that plans are being perfected for an even larger mill to be built at some point on the northern coast of the island. It is said that the mill will be a ten-band one and will have a capacity of 400,000 per day of ten hours. The company owns one of best timber limits on the island, and do an extensive export trade, shipping to the Orient, South Africa, South America and Australia.

It is reported that the second mill owned by the E. McLaren Co., of Ottawa, and situated on the Fraser about two miles above this city, will again be put operation in the near future. The mill of the company Barnet, which has been idle for several years, is being overhauled and will be in operation again in about months.

Mr. Murray, forest ranger, has recently made several seizures of timber in order to enforce the payment Government dues thereon. This timber has mostly been cut for cord-wood, shingle bolts and for making oars. The making of oars is an industry larger than might at first be thought. The oars are made by the thousands, and the trade is altogether in the hands of the Japanese, who usually take the best and largest trees, cutting trees six feet in diameter. The straight and even parts are used, the heart and any portion with the least knot being rejected. The Government, however, requires that dues be paid on the entire log at the rate of 50 cents per thousand feet.

New Westminster, B. C., Feb. 19th, 1900.

DOMINION FORESTRY ASSOCIATION.

THE committee appointed at a preliminary meeting held in Ottawa recently to consider the formation of a Dominion Forestry Association have called a meeting for March 8th next, in the Railway Committee room of the House of Commons, to take final steps. All persons interested are invited. Following is a copy of the invitation issued by the secretary:

OTTAWA, 6th February, 19

DEAR SIR,—

I beg to inform you that at a meeting of several gentlemen interested in Canadian forestry, held at Ottawa on the 15th of January last, a resolution was passed appointing a committee, consisting of—

Hon. Sir H. G. Joly de Lotbiniere, of Quebec,

Wm. Little, Esq., of Montreal;

J. R. Booth, Esq., of Ottawa;

Dr. Wm. Saunders, Director of Experimental Farms, Ottawa;

Thos. Southworth, Esq., Chief of Ontario Forestry Bureau, Toronto; and

E. Stewart, Esq., Chief Inspector of Timber and Forestry, Department of the Interior, Ottawa,

to call a meeting of all persons interested, to be held in the city of Ottawa, for the purpose of considering the formation of an association to promote forestry in Canada.

The said committee to prepare for submission to the meeting a constitution and by-laws and also a programme consisting of addresses on appropriate subjects for discussion at the meeting.

In pursuance of the above resolution and on behalf of the committee, I beg to inform you that such a meeting will be held in the Railway Committee room of the House of Commons, on Thursday, the 8th day of March, at 10 o'clock a.m.

The committee is very desirous that a good representation from all parts of the Dominion should be present. They are of opinion that the time has arrived when the efforts being made by our various governments for the adoption of rational forestry methods should be assisted and guided by intelligent public opinion, and that this can best be done by the formation of such an association as they have in view.

The committee cordially invite you to be present at the meeting, and you are also requested to invite any other persons whom you think might be interested in the subject.

Yours respectfully,

E. STEWART,

Secretary of Committee.

It is hoped that there will be a large attendance of persons prepared to assist this important movement.

THE CANADA LUMBERMAN

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CANADIAN FORESTRY ASSOCIATION

SUCCESSFUL ORGANIZATION MEETING IN OTTAWA.—OFFICERS ELECTED.—DISCUSSION OF FORESTRY PROBLEM.

CANADA is rich in natural resources, and her wealth of timber area is unquestionably an important asset. Hence it is that those in power have seen fit to take steps to preserve and in places increase this asset, which is destined to become all the more essential and important as the various provinces increase in population. A Canadian Forestry Association has accordingly been formed, the promoters of which fully realize the absolute necessity of protecting standing timber and reforesting such sections of the Dominion not enjoying the benefits, even blessings, of well distributed and lusty forest growths.

At the inaugural meeting, held in the Railway Committee room of the House of Commons, Ottawa, on Thursday, March 8th, Sir Henry Joly de Lotbiniere, Minister of Inland Revenue, presided. In the assembly were representatives from nearly all the provinces and territories, and the proceedings were conducted and the papers discussed in a manner that bespeak success for the Association. In his introductory remarks the chairman stated that those who were most interested in and intimate with matters affecting the timber resources, encouraged by the success attending the efforts of the promoters and members of the American Forestry Association, had decided that the present was an opportune time to establish a Canadian association working along similar lines. The primary object would be to advocate and encourage judicious methods of dealing with our forest wealth. Canadians connected with the American Association knew the great success it had attained in this direction, and even greater success should be attained in Canada, where the forests still remain to a great extent under the control of the Crown. Another object was to awaken public interest to the true dangers resulting from undue destruction of the timber along the waterways and sources of supply. The chairman also considered that the public domain should be thoroughly explored and the proper resources and the best uses of the different portions properly ascertained. With this object still in view, a portion of the unappropriated land, he considered, should be permanently reserved for the growth of timber. He thought it a mistake to permit settlers to go upon land which is utterly unfitted for agriculture and which must be vacated only after the valuable timber thereon is destroyed. In conclusion, Sir Henry drew attention to the necessity of educating Canadians, through schools and otherwise, on the forestry problem, with respect both to the prairie and wooded districts, and to show them the necessity of encouraging forest tree planting, from a climatic and economic, as well as an artistic standpoint.

It was unanimously decided to organize the Canadian Forestry Association.

A constitution was adopted, which provides that the objects of the association shall be as follows:

(1) To advocate and encourage judicious methods in dealing with our forests and woodlands.

(2) To awaken public interest to the results attending

SIR HENRY JOLY DE LOTBINIERE,
President of the Canadian Forestry Association.

the wholesale destruction of forests as shown by the experience of older countries in the deterioration of climate, diminution of fertility, destruction of rivers and streams, &c.

(3) To consider and recommend the exploration as far as practicable of our public domain and its division into agricultural, timber and mineral lands, with a view of directing immigration and the pursuits of our pioneers into channels best suited to advance their interests and the public welfare. With this accomplished a portion of the unappropriated lands of the country would be permanently reserved for the growth of timber.

(4) To encourage afforestation wherever advisable.

(5) To promote forest tree planting upon farm lands where the production of wood is too low, especially in the treeless areas of our North-Western prairies, upon highways and in the parks of our villages, towns and cities.

(6) To collect and disseminate for the benefit of the public reports and information bearing on the forestry problem in general, and especially with respect both to the wooded and prairie districts of Canada, and to encourage the study of forestry by the rising generation.

The following were elected as officers of the association: Honorary president, Lord Minto; president, Sir Henry Joly de Lotbiniere; vice-president, Mr. William Little; secretary, Mr. E. Stewart, Inspector of Forestry, Department of the Interior, Ottawa; assistant secretary and treasurer, Mr. R.H. Campbell; directors, Messrs. Hiram Robinson, E. W. Rathbun, C. Jackson Booth, Thos. Southworth, Hon. G. W. Allen, Dr. Saunders and Professor Macoun.

At a subsequent meeting of the Executive Committee the following vice-presidents for the different provinces were appointed: Assiniboia, Hon. W. D. Perley; Alberta, Mr. Wm. Pearce; Ontario, Mr. J. B. McWilliams; British Columbia, Mr. H. Bostock, M. P.; New Brunswick, Hon. D. C. King; Quebec, Hon. S. N. Parent; Manitoba, Mr. Stewart Mulvey, Saskatchewan, Mr. Thomas McKay; Prince Edward Island, Hon. Donald Ferguson; Nova Scotia, Dr. A.H. McKay; Keewatin, Lieutenant-Governor of Manitoba, Athabasca, Mr. Wilson, Yukon, Mr. William Ogilvie.

The membership fee was placed at $1, life membership being secured by the payment of $10. The following parties interested and who were present at the meeting forthwith joined the association. Sir Henry Joly de Lotbiniere, Prof. Wm. Saunders, Ottawa; W. D. Perley, Wolseley, N.W.T.; William Little, Westmount; G.W. Allen, Toronto; Jas. Honidag, Quebec; Finlay Young, Killarney, Man.; R.H. Campbell, Ottawa; M.J. Butler, Deseronto; D. James, Thornhill, Ont.; J.B.McWilliams, Peterborough; E.Stewart, Ottawa; Frederick Todd, Montreal; Alex. MacLaurin, Charlemagne, Que.; Robt. Bell, Ottawa; Robt. Hamilton, Grenville, P. Q.; John F. McKay, Montreal; Hon. E. J. Davis, Toronto; F. W. Gibson, Crown Lands Department, Toronto; Aubrey White, Crown Lands Department, Toronto; Thos. Southworth, Crown Lands Department, Toronto; J. M. Macoun, Ottawa; W. T. Macoun, Ottawa; Hiram Robinson, Ottawa; Gerald Spring Rice, Pinse, N. W. T.; B. Spring Rice, Pinse, N. W. T.; R. F. Stupart, Toronto; J. R. Duff, School of Science, Toronto; C. E. C. Usher, Montreal; Sir Wm. Hickson, Montreal.

The annual meeting will hereafter be held in Ottawa on the first Thursday in March, and special meetings shall be held at such times and places as the executive may decide.

AFTERNOON SESSION.

At the afternoon session interesting and instructive papers were read. The first was by Dr. Bell, L.L.D., M.D., F.R.S., of the Geological Survey of Canada, and is printed below:

CANADA'S NORTHERN FORESTS.

By Robert Bell.

The subject of the distribution of the forest trees in Canada has come particularly under my attention, as I have had the opportunity of travelling for forty years in the north country as geologist for the northern region. The forests of North America exhibit a variety and

grandeur greater than those of any other country or continent in the world. The reason is supposed to be connected with the condition of the earth before the glacial period. It is supposed that the polar regions had a climate fitted for most of our northern trees. After the disappearance of the glacier the trees have been working their way northward again. Some of the limits already reached are the extreme possible limits, others are not. The trees whose seeds are scattered by the wind, such as the poplar and coniferous trees, will spread more quickly, while others, such as those that have their seeds in the form of nuts, will travel more slowly, the seeds being few in number and being more slowly distributed. A single poplar might distribute seed over a whole country in a single year.

The verge of the forest is at present moving southward, both in America and on the continent of Europe, but still a number of trees have not yet had time to reach their northern limit. An example of this is the black walnut, which is abundant in western Ontario, but only occurs in isolated cases at Ottawa and Quebec. This is one of the trees with which our chairman, Sir Henry Joly, has been making experiments in Quebec.

The number of species of trees in North America is larger than in any similar area. There are 340 species between our northern limit and the Gulf of Mexico. The British islands have only fourteen species, and over the whole continent of Europe there are only twenty-five to

MR. WM. LITTLE,
Vice-President Canadian Forestry Association.

thirty species. In Canada there are about 120 species, 95 being east of the Rocky Mountains and 25 west of that line. As the continent diminishes rapidly to the south we must necessarily have a large number of species in the south, so in the north we have large forests with a small number of species and in the south small forests with a large number of species.

The chief factors in causing a flourishing growth of trees are the climate and a sufficiency of moisture. The variations of the climate in North America admit of a great variety of growth from the conifers in the north to the tropical trees of the Gulf of Mexico in the south.

The northern forests of Canada stretch from Labrador to Alaska, some four thousand miles, and have a breadth of fully 600 miles.

Western Canada is not wooded in the plain and prairie country. In the eastern, or prairie country, there are clumps and bluffs of poplar, but on the plains only a few trees in the deep valleys of the rivers. This region is triangular in shape, being about 600 miles in width and 600 miles on each side. It is wooded principally with poplar, birch, etc., and in the north there are considerable areas of coniferous trees.

In the area of our northern forests we have about thirty times the area of England. The area of England is about 59,000 square miles. From Ottawa to James Bay is about 600 miles, and it is about 600 miles farther to the northern limit of forests. In Labrador we have an area 1,000 miles wide by 1000 miles from south to south, equal to the whole of Europe, and covered by timber on the east side of Hudson's Bay to latitude 54 north. On the west side of Hudson's Bay the range is to latitude 59 north, and continuing west in the Mackenzie basin it reaches latitude 68 north, beyond the Arctic circle.

This sketch of our great forest wealth will show the necessity of some steps being taken to protect and preserve the forests, as well as to ensure the deriving of a proper revenue from them, and shows the necessity for the organization of an association such as the one formed here to-day.

As a result of the climatic conditions the timber lines run in almost parallel lines, although not in all cases. The mean temperature of the year does not cover the extremes of heat and cold, proximity to the sea or the prairie region, former geological conditions, etc., all of which affect the distribution of the trees.

The white cedar is one of the most peculiar in regard to its limits. The reason why it does not extend further west than the eastern part of Manitoba is probably due to the dryness of the climate. There is, however, a patch on the west side of Lake Winnipeg, near Grand Rapids, which was probably started from seed carried by the Indians. They are fond of decorating their canoes with branches of cedar, and the seed may have been carried on branches taken in this way from the eastern side of the lake. Isolated colonies of other species are probably due to the fact that these specimens are in advance of the main body. The white cedar is at its perfection in Gaspe and New Brunswick, occurs but little in Nova Scotia, while there is none in Cape Breton or Newfoundland. There is no trace of it on the outside of the Labrador coast, owing to the biting sea air. In the north the direction of its line of growth is due to the cold-ness and dryness. There is not much barren land, except in Labrador and west of Hudson's Bay, practically all of the Dominion being well wooded.

In Ontario and Quebec the limits of the trees are a pretty good indication of climate, but in the west other factors, such as soil and moisture, affect the problem, because the same species does not always grow under the same conditions. For example, in the south some species will seek the coolest situations, and in the north the warmest. The white cedar, balsam, pine, tamarack, white spruce and white birch choose the coolest places in the southern parts of Ontario, while farther north they seek the warmest.

The white pine is comparatively southerly in its distribution, being found only in Ontario and Quebec about to the divide between James Bay and the southern slope. North of Lake Superior it has been destroyed by fire and has not had time to reproduce itself. It occurs in Newfoundland, but not in very extensive forests.

A bird's eye view of the country in which the spruce grows would show a patchy appearance, due to the fact that different areas have been burnt over at different times. The spruce forest attains its full growth in 150 years, and there will be patches of this tree of all sizes and ages up to 200 years.

The origin of forest fires in accessible parts is usually due to travellers, explorers, miners or settlers handling fire carelessly. Vast amounts of valuable timber have been destroyed in the past in this way, and a great deal is still destroyed by Indians and others leaving fire. But I think that the greatest cause of forest fires in the north is lightning, though there may be other causes. One of the most curious of which I have heard is told of in a tradition of the Indians in regard to a fire in the Lake Temagami district. They ascribe it to a shooting star, quite a possible reason. Other causes may be the spontaneous combustion of pyrites, etc. One of the principal causes in the accessible parts of the country is the facility of getting matches. Eddy's matches are probably responsible for a great number of the fires. If people had to employ flint and steel the fires would probably not be so numerous.

I have calculated that about one-third of the country may be considered as brule, that is, under second growth up to about ten years of age; one-third as intermediate, including trees between ten years of age and upwards, and one-third including trees assuming the character of trees up to those of one hundred years of age. These make up an area thirty times as great as that of England. Any of the one-thirtieth parts will produce wood enough to supply the ordinary demands of the ordinary population of Canada, that is, five million people could get what is required for mining, fuel, etc., by taking the timber from a space the size of England, and would be able to allow the twenty-nine other parts to grow up to be ready later on.

Spruce trees grow much more rapidly fr... thirty years than they do afterwards. Very l... is made between thirty and one hundred yea...

If any proof is wanting of forest fires having ... in remote time, it is supplied by the post-ter... where we find the charred remains of tr... Scarboro heights near Toronto trees have be... two or three hundred feet below the surfa...

MR. E. STEWART,
Secretary Canadian Forestry Association

have also been found elsewhere. We have ... in the habits of trees, such as the Banksian pine, ... requires fire to facilitate, if not to continue its ... tion. The cones are exceedingly numerous, ... curve inward and adhere to the branch closely, ... grow in bunches of three or four and will remain ... tree till it falls away with old age. Though ... be true that this is not the only way, the seeds ... from the cones by the aid of fire. The cones ope...

MR. R. H. CAMPBELL,
Assistant Secretary and Treasurer Canadian Forestry Associ...

the heat and the wind blows the seeds every ... habit may have been developed like other ... posed to be accounted for by the Darwinian ... Since I have published this statement other ... have noticed that cones were opened when ... fires, but I think it was due to the sickly condition ... trees and especially to the trees being young ... immature cones opened by some unforward ... Cones on large thrifty trees are closed until ... fire. Any tree which has its limits north extends ... south except the Banksian pine, which is almost ...

to the Dominion of Canada. The trees are at their perfection at the centre of their distribution.

DISCUSSION.

equest of Dr. Saunders, Dr. Bell indicated map the line of northern distribution of er-leafed maple (Acer dasycarpum), which hown to generally a little south of the an Pacific Railway line north of Lake r. Dr. Saunders stated that he had found asycarpum as far north as Portage la

Henry Joly: My investigations indicate e white spruce does not grow as fast as 's experience seems to suggest. I have thousands of white spruce logs in the rhood of Quebec and have never found age more favorable than one inch in five ears, so that thirty years would only give ix inches.

Henry Joly exhibited two specimens of pruce as an illustration of his remarks. there had been an increase of one inch eter in seven years.

Saunders: In the Maritime Provinces we and that the white spruce will reach from welve inches of timber one foot from the in ten years. We have many specimens Experimental Farm there, of which ments have been taken from time to time, climate there is much more moist than in

The rate of growth of white spruce is mportant point, as it is required for pulp, s important to know in what time we oduce a pulpwood crop in Quebec.

William Little: The question in connec- h spruce is an important one, as it is for pulpwood. It must be borne in owever, that the timber grown in the the important matter, not a single tree in the garden. We have spruce trees of s growth in our garden, but they are all . It would be impossible to get a thir- fourteen foot log out of them.

W. D. Perley: I can remember a field Brunswick which was a pasture when I y living there, but it is now all grown overed with spruce bush.

illiam Hingston: The fact should not ight of that the spruce has no definite f growth, that the growth depends upon ditions. I have been planting for years ur, sometimes five hundred spruce, and certain area can tell what trees will t and what trees will grow slowly. at are well protected will grow the most Some trees grow as much in three others in twelve years. I would like to Bell whether he thinks that low elevation to do with the growth of trees. Is it uestion of high or low elevation than titude? If a high level plain occurs is abrupt change? Also whether there ange in the umbrageous character of the o elevation?

ell: I consider that elevation has a l to do with the growth of trees. When change in the elevation occurs there is y sudden cutting off of trees. As we the line of perpetual snow moves lower n passing from Lake Superior to Hud- we lose sight of certain trees in crossing of land, and after descending on the the same trees appear again.

Dr. Saunders: Does increase in elevation help the growth of certain trees.

Dr. Bell: Some grow better on high land, for instance the hard maple.

Dr. Saunders: The reason I asked that ques- tion is because I have found on the Riding Mountain, at an elevation of 1,800 to 1,900 feet, Populus tremuloides growing to a great height, while on the lower ground it was not nearly the same size.

Mr. W. T. Macoun: Has the white pine been found growing upon swamp land?

Dr. Bell: It grows on swamp land in some places in Western Ontario.

Dr. Saunders: How far north does one go before the tamarack changes its character as to choice of ground? I have seen tamarack in wet ground as far north as the Swan river.

Dr. Bell: The change takes place about the height of land. The absence of trees in Mani- toba must be due to some inherent difference in climate. The trees do not stop abruptly on reaching Manitoba, but begin to curve southward east of that line.

Dr. Saunders: Why is it that on the southern banks of the rivers in the west the trees are of considerable size, while on the northern bank they are smaller? Is not this due to fire?

Dr. Bell: I have noticed the east and west banks show the same difference, the east slopes having a better growth than the west. I think it is due to the fact that in the spring, being exposed to the sun on the south-facing bank, the sap is forced up early and the first severe frost bursts the bark and destroys the tree.

Dr. Saunders: We have had apple trees killed at the Experimental Farm before they were large enough to run sap.

Mr. Stewart: I was at the meeting of the Manitoba Horticultural Society lately, and Mr. Stephenson there showed specimens of wealthy and hibernal apples grown at his place in Man- itoba. The apples were well-formed and matured.

Dr. Saunders: I know Mr. Stephenson's place well and the trees are growing at an eleva- tion of less than 700 feet. There is heavy wood to the north and west, while the orchard is so surrounded by evergreens that it is difficult to find it.

HISTORY OF ECONOMIC FORESTRY IN ONTARIO.

Mr. Thomas Southworth, Chief of Forestry for the Province of Ontario, read a paper on the "History of Economic Forestry in Ontario," in which he outlined the steps which had been taken by the early government of Canada for the reservation of timber, and also the policy now being followed in regard to the setting aside of timber reserves such as that at Lake Temagami, the forests on which would be dealt with in as scientific a manner as possible. At one time, Mr. Southworth stated, the forest was consider- ed by the settlers to be an enemy to be removed. As a result, in some of the older counties of Ontario, the present wooded area was less than 5 per cent. of the whole. The land burned over is still unsettled and unsuited for tillage, and should be placed in forest reserves. Fire rang- ing, Mr. Southworth said, served both to protect and establish the timber areas. He considered it was fortunate that the crown kept control of the timber instead of disposing of it to lumber- men, as had been done in the United States. During the French occupation the home govern- ment made no provision to protect any but the oak timber, but happily this condition of affairs had been improved on. Amongst the measures adopted for the protection and reproduction of the forests were the remission of taxes on forest lands and the establishment of Government nurseries similar to those supported in New Zealand. The high lands, he maintained, should be kept well timbered, as the rivers have their sources there. The fact was mentioned that farmers are now planting trees as wind-breaks to ensure better crops. Mr. Southworth referred to the fact that the fire rangers had saved many million feet of timber, and Mr. J. R. Booth re- marked that there was not one fire now where ten occurred years ago. This happy improve- ment was due to the efforts of the lumbermen themselves as well as the rangers.

Prof. John Macoun, F.L.S., F.R.S.C., Assist- ant Director and Botanist of the Geological Survey of Canada, then read the following paper:

THE DEFORESTATION AND REFORESTATION OF THE WESTERN PRAIRIES.

By Prof. John Macoun.

I wish to make some statements with which some of you gentlemen may not agree, but I know of what I am speaking and am prepared to support my views, and I hope those who may be of a contrary opinion will put for- ward their view of any questions that may be discussed.

There is a diversity of causes for prairie fires. The time was when a large part of Manitoba was covered with forest, and also immense tracts of Eastern Assini- boia. In fact, south of Indian Head less than forty years ago there was a considerable growth. In places where now there are no trees and where settlers say that trees will not grow, forty years ago they were covered with forests.

I want to corroborate a statement of Dr. Bell's. I saw two prairie fires in 1894 at Crane Lake caused by light- ning. If prairie fires are caused by lightning, Dr. Bell is probably right in saying that forest fires to the north of the prairies are so caused. I have seen three or four thunderstorms succeed one another on the prairie, without any rain. I was on the prairie before the settlers. I had the privilege of exploring in the year 1879 [illegible] measured miles on the prairie travelling, in carts, and in 1880 between eighteen and nineteen hundred miles. At that time the prairie was covered with grass in places, and in other places there were many tracts of burnt forest, especially on the edge of what is the prairie now. Beyond Last Mountain, before you reach Long Lake, we came to the edge of the prairie and we got no more wood for two weeks. But I want to call your attention to one thing we noticed. South of where Humboldt is now, we saw a small patch of [illegible] with a pond or stream. And what did this mean? When the prairie fire went round the pond it would leave a small triangular piece unburned.

Twenty years ago I went to Captain Dewdney and said, "The Touchwood Hills have no existence. What did I mean? They were wooded, while the rest of the country was bare, so that they had an appearance of height which really did not exist. And why was this so? Because in front of the hills a continuous series of ponds of water was found. When the fires came to the ponds they ceased to exist. The whole country was wooded and we called it "hills."

At Moose Mountain I found a whole series of ponds on the north side of the mountain that it was impossible to fire. The mountain was a tract of land covered by wood. In late years these ponds have dried up and the fires have gone in.

In the country south of Battleford as the fires came from the south or south-west, I found that, as the fire came up on the ridges, the south or west slope was burnt off, but the north face was heavily wooded. If cold was the cause why should this be the case? The real explanation is that the fires burnt to where it was moist and then stopped. Next year it pushed farther and farther on until from latitude 51 to latitude 54 the land is burnt out. It is burned in the same way north of the Saskatchewan, and so with the woods in the Peace River Valley, which I examined in 1872 and 1875.

But there are tracts that never produced wood. Wherever alkali is found in the soil the trees do not grow. This alkali is not potash, derived from the ashes of fires, but is derived from gypsiferous rock.

The saline lands are not suited for timber. When I was travelling in autumn the Half-Breeds would go to a pond and try the water by tasting it. But I would send them directly to one which I knew contained fresh water. *How did I know?* I found that in the spring of the year, when the ponds were filled, nearly all, except the salt lakes, were fresh. The pond has an impervious bottom and in the fall of the year it begins to be salt. In the latter part of August and September the sedges, which remain fresh in the fresh water ponds, lose vigor and change color where the water is saline. Men who have thought much will make trivial things mean much for them.

How do we get humidity? What is the benefit of a forest? What is the difference between a country covered with grass and a country covered with forest?

A tree turns out thousands of leaves and has great roots far down in the ground, and the sun is pumping water out of the tree all day long. It is pumping water out of the depths of the soil, and that water for hundreds of square miles is passing into the atmosphere. The cutting off of the forests means that the rainfall will be carried off the soil too quickly. The atmospheric currents are not interfered with, but are only *prevented* from taking the humidity out of the air. Thus you have the climate suited to the growing of cereals. The humidity in the air compensates for the want of it in the climate.

In the sub-arctic forest the trees are spruce, white and black; one pine, the Banksian; one balsam, *Abies balsamea*; two poplars, *tremuloides* and the balsam poplar; and tamarack. The north country produces these and no others. Of the elm tree, which does not grow on the prairie, there is a magnificent specimen occuring fourteen miles north of Regina in the valley of Qu'Appelle. The elm is a river bottom tree. The oak extends from the Maritime Provinces up on the prairie to Fort Ellice. The red ash occurs to half way across Assiniboia at the Dirt Hills, four hundred miles west of Winnipeg.

In 1879 the country up to Moosejaw had a sufficient rainfall for the growth of cereals. In all that country there should be no difficulty in re-covering the whole with forest, with poplar and white spruce. I eliminate the cold and the chinooks altogether.

Let us consider, now, the main prairie, including the country four hundred miles from Moosejaw to Calgary. Mr. Pearce has solved the problem of tree growing at Calgary and will tell you what he has done. I saw Mr. Pearce's place before he planted trees and can tell how successful he has been.

My report of 1880 showed that this district was not a desert. Where there is a sward there is no desert. How are the trees to be got on? Precisely in the way that they were taken off. I say that cold has nothing to do with the want of success in growing trees, it is the want of water and water only. Ten years ago, when I was in the west, a gentleman now deceased, but then Mayor of Calgary, said to me, "The chinooks prevent the growth of trees." I called his attention to a large tree in the valley of Bow River. I asked why one was killed while another was left. The reason was that one had water and the other had not. When the trees are planted on the prairie and given sheets of water, as has been demonstrated by the success of the efforts of the Canadian Pacific Railway Company at Moosomin and Medicine Hat, they will grow and thrive. If it can be done in one place it can be done in another.

When at Indian Head in 1880 I saw a dam built over a creek, and, when asked to speak at a gathering in the evening, I told the people that I would like to see them raise a statue to the man who built that dam. There is a dam also at the Experimental Farm and the trees growing there are proof of the success of a water supply.

In the prairie region west of Moosejaw there should be dams put across the creeks and some spruce and some poplar put in the beds and valleys, and you can then extend indefinitely. There are the conditions that exist wherever there are trees. The trees grow in all the hollows. There must be a snow-catcher and the trees will grow. The trees must be grown from seed. You take up a tree and cut the tap root and set it down in another place and the drought gets below to the root. The almost inevitable result is that the tree withers and dies.

In 1880 we reached Stinking Lake, and north towards the Saskatchewan in some sand hills we discovered twenty-three big poplar trees, none less than one foot in diameter, and not a shrub around them. The conclusion I reached in regard to them was that the sand hills received the water from the air and the trees stayed where the water was, and the fire could not get at them. That satisfied me that neither chinooks or cold had to do with the matter.

An important point where a dam might be built is at Cypress Lake, in order to make use of the water out of the Cypress Hills.

A paper on "Tree Planting in the West" was read by Mr. William Pearce, Superintendent of Mines for the Department of the Interior at Calgary. He stated that no great skill or effort is required to reforest the great treeless plains of the west. It could not be done economically, however, he claimed, if water had to be artificially supplied. Irrigation is a necessity for forestation, he said.

Mr. Archibald Mitchell, formerly forester for Lord Dunraven and the Earl of Roseberry in England, submitted the following contribution relating to forestry in the North-West:

FORESTRY IN THE NORTH-WEST.

By Archibald Mitchell.

I do not think it will be at all necessary for me at this time to touch upon the principles upon which the future forest system of Canada ought to be based. In the face of such a committee, formed for such a purpose, I feel that anything I could say in that connection would be unnecessary and altogether uncalled for.

Upon the existing forests of Canada then, I will say little beyond expressing the hope that a thoroughly sound system of forest economy will very shortly be established. It seems to me that the people of Canada are suffering from a lack of information on this subject. If it only could be placed before them, laying due emphasis upon the necessity for such a system, together with the general principles upon which it will be based, I believe we should very soon have it in full working order. Canadians are a business people, and a system founded upon a solid business basis could not but appeal to them and win their approbation.

This Association, I have no doubt, will speedily accomplish the object for which it has been constituted, and Canada will in a very little while be in possession of a forest system which will be a splendid monument to posterity of Canadian intelligence and business enterprise.

With regard to the needs of the West, however, perhaps I may be allowed to say a few words, more particularly with regard to the grazing regions of Southern Alberta and Assiniboia. These regions, it is superfluous to mention, form a magnificent stock-feeding area, and the prairies in summer are covered with thousands of cattle and horses. I say summer advisedly, because in winter or at least whenever rough or cold weather is experienced the stock seek the shelter of the river-bottoms. They get among the willows there and congregate in great numbers. Food, naturally, soon gets very scarce, and the animals become quite poor in condition, and in prolonged cold weather many of the weakly ones die. There is abundance of food out on the prairie, but the rigor of the climate prevents its being used. When a chinook wind occurs and the snow is swept off the grass, the cattle will very often refuse to leave the brush because of the cold north wind, or, when they do leave it, they do not get far into the good grass before another storm compels them once more to return to shelter.

Now, if there were groups of trees, say about 30 to 40 acres in extent, planted all over the prairie a few miles apart, all this would be avoided. The cattle would have shelter close beside their feeding grounds, they would never lose a condition, and much pecuniary loss to their owners would be avoided.

Every rancher in this country well knows how much such plantations would add to the value of his stock, but the scheme is one which is too large for private enterprise to undertake. Very few ranchers, indeed, have succeeded in raising even a shelter belt around their houses. As a rule they do not know how to set about raising a plantation, and they have little time to experiment. Their business is stock raising, and they attend to that.

It is a scheme for the government to undertake, and as a branch of *creative* forestry, is well worthy the [illegible] of this Association. Perhaps the already [illegible] machinery of the experimental farms would be [illegible] to cope with it, and at any rate their experience [illegible] of the greatest value in furnishing data [illegible] select plants, etc.

And now a few words with regard to the [illegible] of the question. The trees planted would [illegible] pines (chiefly black Austrian), spruces and [illegible] woods suitable for the North-west. They [illegible] planted in groups of each sort, say an area of [illegible] than 100 yards diameter to each group, [illegible] the whole of a plantation could consist of six [illegible] The plants would be from two to three feet, certainly not more than three feet. Care [illegible] planted when they were three years old, i.e. [illegible] seed-bed and one year transplanted. How [illegible] be planted as seedlings, but would be better [illegible] seedling and one year transplanted. The [illegible] plants the greater the proportion of roots and [illegible] they are handled. There is less risk of the [illegible] injured in the lifting. They are less easily blown [illegible] the ground, as their tops are close to the [illegible] besides are much more flexible, and there is [illegible] least on the flat, a stratum of air about one foot [illegible] ground which is calmer in a storm than it. [illegible] The seedling plants would be raised in a [illegible] venient for such a purpose and central to at least [illegible] of the proposed plantations.

All areas to be planted would be ploughed and [illegible] with oats or other grain. These crops would [illegible] ameliorate and loosen the surface soil for the [illegible] tions, and besides provide somewhat to help [illegible] expenses. After the lifting of the crop and [illegible] fall the plantation grounds would require to be [illegible] ploughed about 18 inches deep and left [illegible] winter. This would loosen the soil for the [illegible] help to catch and retain moisture for the growing [illegible] This is a most important consideration in South [illegible] for the frequent chinooks melt the snow, which [illegible] runs off the surface and by and by finds its way [illegible] rivers and lakes because the frozen ground will [illegible] it to penetrate into the soil. The rough, broken [illegible] left by the plough would help to collect this water [illegible] hold it till spring, when it could soak into the ground.

In the meantime the plants for each area [illegible] have been transplanted into lines in the [illegible] were to ultimately occupy. Another crop of [illegible] would be taken off the trenched land and the [illegible] slipped in on the stubble in the spring following, [illegible] plants being already on the ground much [illegible] drought during the planting would be avoided, [illegible] ground being comparatively level and held by the [illegible] there would be less risk of the plants being buried [illegible] a condition of affairs which must be reckoned with [illegible] country. There would be little danger of [illegible] damaging the plants, as insummer they would [illegible] them and in winter when the grass was covered [illegible] snow, the trees, at first at any rate, would be [illegible] snow also. By and by, when they got above [illegible] they would be of size enough to recover any little [illegible] that might be incurred.

Once established, growth would be most rapid. [illegible] 15 years the plantations would be as many [illegible] The drifting snow would be caught by the [illegible] remain there to gradually melt with the heat [illegible] The ground being then soft a plentiful supply of [illegible] would sink into the soil for the use of the [illegible] falling needles, too, and forest mosses would [illegible] and retain large quantities of water. The [illegible] run off to the outside of the wood and help [illegible] grass on the prairie all round the plantation. [illegible] would just be on a great scale what is to be seen [illegible] coulee and scrubby patch in the country, the [illegible] be retained till the ground was well [illegible] This, indeed, seems to be the trouble with the [illegible] semi-arid regions of S. Alberta and Assiniboia [illegible] of moisture falls in the form of snow but the [illegible] it while the ground is frozen. It cannot [illegible] and so finds its way at last into the rivers or [illegible] low pools on the surface to be dried up by the [illegible] days of real warm weather.

And another effect the afforestation would [illegible] bring about. Forests, as is well known, collect [illegible] from the air, and many additional springs [illegible] probably be formed around the woods, a matter [illegible] siderable importance when perhaps for miles [illegible] available for the cattle except, may be, a [illegible] impregnated lake.

And yet another benign influence might [illegible] retention and subsequent gradual evaporation of [illegible] quantities of water in the district would cause [illegible] of moisture in the atmosphere and possibly [illegible] increased rainfall as a result of that; and who can [illegible] mate the value of such a blessing to the [illegible] of the west. Even this alone would warrant the [illegible] of this or some such measure as I have here [illegible] The experiment, if conducted on a sufficiently [illegible] hensive scale, would be a magnificent one, and [illegible] tion would be well worthy of the intelligence [illegible] prise of the people of Canada.

It is not, of course, intended that this paper [illegible] indicate in any arbitrary fashion the course to be [illegible] in this matter. It is simply intended to draw [illegible] what is felt to be a real need in the country and [illegible] out briefly the general lines in which it may be [illegible] such scheme will be of infinite benefit, and in the [illegible] for the department of Canada the partial afforestation [illegible] this section of the North-West in something [illegible] manner indicated will deserve a most worthy [illegible]