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The Coming Convention.

Sir. Wilfrid Laurier, Premier of Canada and Honorary President of the Canadian Forestry Association, has announced that a convention in the interests of the conservation of the forests and other natural resources of the Dominion will shortly be held in Montreal. The date had not yet been fixed at the time of going to press.

Following the passage of the bill to provide for the formation of a Canadian Conservation Commission and the subsequent appointment of the commission, as noticed elsewhere in this issue, this is an important advance in the direction of the formation of a policy of proper management and economical use of the resources of the Dominion, and as such the convention should receive the hearty support of the members of the Canadian Forestry Association. Further particulars will shortly be announced.

The Regina Meeting.

The special meeting of the Canadian Forestry Association which convened at Regina on Friday, Sept. 3rd, proved to be a thoroughly successful one. The highest officials of the province lent the weight of their presence and hearty commendation to the occasion, and at both the day and evening sessions on Friday large numbers of citizens also were present. The day sessions were held in the spacious Council Chamber of the Regina City Hall, and at the opening meeting on Friday morning this was well filled, about two hundred persons being present, many of whom were ladies. The attendance of a large number of the Normal School students was a much appreciated feature and one from which good results will no doubt follow. The lectures in the evening were given in the large auditorium of the same building and were also largely attended.

The excursion to Indian Head on the following day and the visits to the Forest Nursery Station and the Experimental Farm were well patronized and the wonderful progress made at each of these places won high praise from the visitors. Especially was this the case at the Forest Nursery Station, where the beautiful grounds of the station and the various experimental plantations were viewed with intense interest. It was indeed hard to realize that five years ago there had been but bare prairie where now was to be seen beautiful lawns and flowers and a wealth of trees and shrubbery, and many were the words of praise uttered for Mr. N. M. Ross and his corps of helpers at the station.

THE OPENING SESSION.

The first session of the convention opened at ten o'clock on Friday morning, Sept. 3rd, in the Council Chamber of the City Hall, Regina, the chair being occupied by Hon. W. T. Pipes, Attorney-General and Commissioner of Crown Lands for Nova Scotia and Vice-President of the Association for that Province The President, Mr. Thos. Southworth, of Toronto, had found it impossible to attend the convention owing to pressing business engagements in the East.

To the right of the chairman on the dais sat His Honor A. E. Forget, Lieut.-Governor of Saskatchewan and Vice-President of the Association for that Province. Hon. Walter Scott, Premier of the Province; Hon. W. R. Motherwell, Provincial Minister of Agriculture, and Messrs. R. H. Williams, Mayor of Regina, and P. McAra, jr., President of the Board of Trade of the City, also occupied seats on the dais.

Others present were:

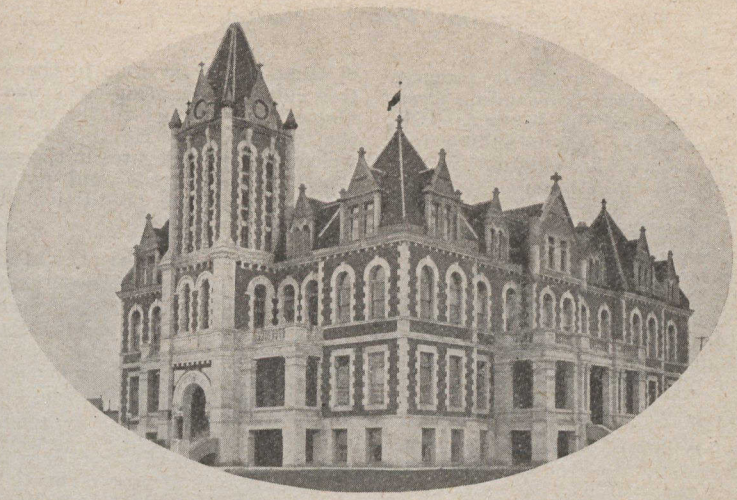
Professor W. Somerville, Oxford University, England; Hon. W. R. Motherwell, Minister of Agriculture for Saskatchewan; R. H. Campbell, Dominion Superintendent of Forestry, Ottawa; Dr. Wm. Saunders, Superintendent Dominion Experimental Farms, Ottawa; N. M. Ross, Chief of Tree Planting Division of Forestry Branch, Indian Head, Sask'; Hon. J. A. Calder, Commissioner of Education for Saskatchewan; Hon. D. Laird, Indian Commissioner, Ottawa; F. C. Tate, M.L.A., Wascana, Sask.; R. D. Prettie, Forestry Inspector for C.P.R., Winnipeg; G. Spring-Rice, Pense, Sask.; G. A. Rimington, Penrith, England; A. F. Struthers, Bridgewater, N.S.; H. C. Lawson, Secretary Board of Trade, Regina; A. Knechtel, Inspector Dominion Forest Reserves, Ottawa; A. H. D. Ross, Lecturer in Forestry, University of Toronto, Toronto, Ont.; J. P. Turner, Secretary Manitoba Game Protective Association, Winnipeg; T. N. Willing, Chief Game Guardian for Saskatchewan, Regina; E. F. T. Brokovski, Battleford, Sask.; W. I. Margach, Chief Forest Ranger, Calgary, Alta.; D. S. McCannell, Regina; Jas. Cowie, Calgary, Alta.; Geo. A. Laird, Broadview, Sask.; H. L. Patmore, Brandon, Man.; A. Mitchell, Indian Head, Sask.; A. M. Fenwick, Regina, Sask.; A. P. Stevenson, Morden, Man.; John Caldwell, Virden, Man.; E. B. Andros, Tyvan, Sask.; A. H. Brown, Regina, Sask.; J. A. Killough, Pense, Sask.; Klaas Peters, Waldeck, Sask.; Wm. Gibson, Wolseley, Sask.; F. W. H. Jacombe, Ottawa; W. A. Davis, Dauphin, Man.; Wm. Sifton, Minitonas, Man.; Wm. Margach, Crown Timber Agent, Kenora, Ont.; C. S. Galbraith, Maple Creek, Sask.; D. McDonald, Virden, Man.; T. H. Tweltridge, Indian Head, Sask.; A. M. W. Patch, Wolseley, Sask.; G. A. B. Krook, Assistant Forester, C.P.R., and others.

The Official Welcome.

The first item on the morning's programme was the address of welcome by Lieut.-Governor Forget, who spoke as follows:

Mr. Chairman and Gentlemen,—Those by whom I am best known will not be surprised to hear me say that I feel highly gratified in being given the privilege of formally opening this meeting, for I have always taken a lively interest in all efforts tending to promote the cultivation of trees. I have a firm hope that what will be done here to-day will not fail of practical results. In any event I am sure I am but faintly expressing the feelings of the community at large in saying that we highly appreciate the action of the Canadian Forestry Association in consenting to hold this special meeting in the capital of this province. We all know that it is difficult to find any very extensive district divided, in its virgin state, in due proportion between forest and plain. As a rule, it is all dense forest or all open country. From the point of view of the agriculturist, of these two conditions the latter is naturally preferred. This is practically the existing condition in this province. In fact the greatest attraction of Saskatchewan is its rich open plain, all ready for the plough, and capable, from the first, of yielding good returns to the settlers. This is so much the case that, although the oldest settlers have been on their lands only a few years, all have done well, and already a considerable number have actually enriched themselves.

However gratifying these results, the absence of trees on the most desirable homesteads was keenly felt from the very first, especially in the case of those who come from places where trees are in greater profusion; and it certainly delights one to see, here and there throughout the province, the efforts that have been made to change this condition. I was personally particularly struck, a couple of years ago, by what has already been done in the way of tree-planting by settlers, in the immediate vicinity of the progressive city of Saskatoon. While such improvements are not unknown on homesteads in various other parts of the province, it is, I believe, more noticeable in that district; and it gives me much pleasure to mention the



City Hall of Regina, in the auditorium of which the meetings of the convention were held.

fact before your association, knowing well that such examples will be duly appreciated by all present.

It is, also, for me a great pleasure to be able to draw your attention to the efforts made, on the same line, at various railway stations—in some cases by the railway companies themselves, in others by the local municipality and private citizens. The work done in this very city, by the corporation, and, in many instances, by the citizens themselves, deserves a particular mention. For some time past, what is known as the C. P. R. Garden at Moose Jaw has been greatly admired, and the example thus set was largely followed by the city itself and by the citizens, with the result that Moose Jaw has become a very charming place. The same can now be said of what the C. P. R. Co. has done around their station here. All these have done much to create and spread a taste for the embellishment of private homes. It is, of course, unnecessary for me to mention the Experimental Farm at Indian Head, as also the newly started Forest Farm at the same place. Both are well known, and have, in fact, become places of resort. Besides, you will be given the opportunity of visiting them both before you have ended your labors.

The many experiments which have thus been so successfully carried out, at various distant points throughout the province, by the settlers themselves, will have done much towards testing and proving the kind of trees or shrubs best adapted to the country; and the experience acquired by the gentlemen whose names I see mentioned on the programme of this meeting cannot fail to be of still greater value to the people of the province who will have the privilege of being present here to-day, or who may read the report of your proceedings.

The chairman, after briefly outlining the aims of the association, then called on Premier Scott to address the convention.

HON. W SCOTT.

Hon. Mr. Scott expressed his pleasure at welcoming the members of the association to the capital on behalf of the people of Saskatchewan and voiced the satisfaction it afforded the western men to have the association hold its meeting in their capital. While little forest was found in Saskatchewan, the people were coming to realize that they had a keen interest in forestry. Considerable educative and practical work had been done and in travelling through the province he noted many new groves on farms this year, and the number of these was continually increasing. At Regina, when first the railway came through, there was not a twig to be found. On one occasion a lady had been going east with her little son, born and bred on the

prairie, and when, in their progress eastward they came to standing trees, he had exclaimed in wonder, "Oh, mother, see all the wood standing up." But now-a-days the children in the west were getting better used to seeing standing trees than was that little fellow. Prominent among the objects of the association was that of tree and forest growing, and for that reason they were welcome. The people of Saskatchewan were coming to realize the value of the work of the association, and would value it more and more highly in future.

MAYOR WILLIAMS, OF REGINA.

Mayor Williams, of Regina, extended a cordial welcome to the convention on behalf of the citizens. He referred to the presence of the Normal School students, whose attendance, he was sure, would be appreciated. The city was working along similar lines with the association in regard to its proposed park system. A total of three hundred and seventy acres had been set apart for park purposes. Victoria Park, right in the centre of the city, covered about seven acres. Around the new Parliament Buildings was another area—about forty-seven acres in extent—which would be used as a park, while to the north of the city about two hundred acres had been set aside to be similarly used. In former days the people had been too busy to plant trees, but now that state of affairs was changing. The home of Commissioner Motherwell might well be taken as a model for prairie farms. Mayor Williams concluded by extending to the delegates a cordial invitation to participate in the luncheon tendered the visiting British Association delegates.

PRESIDENT MCARA, OF THE BOARD OF TRADE.

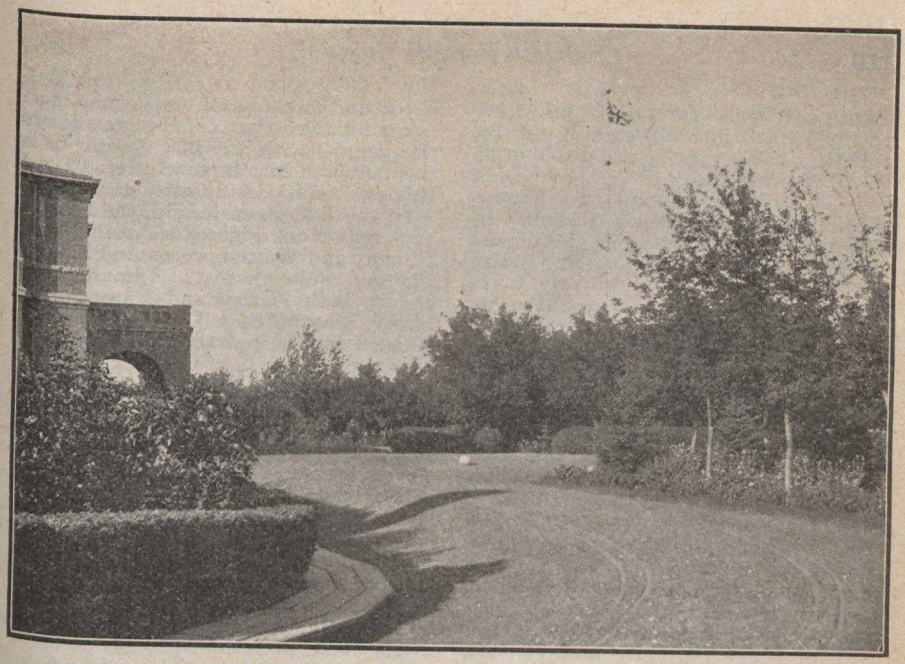
President McAra, of the Regina Board of Trade, was the next speaker. He considered Regina a fitting place for the convention, inasmuch as at one time it had been supposed impossible to grow trees there, and people had even been warned not to break the original sod for fear nothing else would grow. They could see how mistaken those views had been. His Honor the Lieut.-Governor had led the way in the matter of tree culture and his old home was still an example of what might be done in the way of tree culture. Planting trees was twice blessed, benefitting both the planter and the passer-by. He concluded by welcoming the delegates in the name of the Board of Trade and hoped the meeting would be productive of good results.

HON. W. R. MOTHERWELL.

Hon. W. R. Motherwell, Commissioner of Agriculture for Saskatchewan, said it was not often a purely educational association met with the appreciation of the public, and the association must feel gratified with the splendid audience of both sexes. If there was one place where such a convention was needed it was in Saskatchewan. He remembered the first efforts at tree planting by the settlers. Owing to lack of knowledge as to the necessity of cultivation these were largely futile and often the settler gave up in disgust. Since the establishment of the Dominion Experimental Farm and the Forest Nursery Station the efforts of farmers, because of the instruction they received, had been much more successful. Anything done to advance forestry must be done among young people, for when a man got past middle age without becoming interested there was not much hope that he ever would be. Because of this he favored the planting of trees about school grounds and the interesting of teachers in the subject. To this end he had encouraged the visit of Normal School pupils to Indian Head. At first about half the students attended, but now practically all the students were taking part in the excursion and were receiving much benefit therefrom. He contended that by studying the soils of various districts on the plains and the use of proper methods of cultivation trees could be got to grow as readily on the prairies as anywhere else.

HON. W. T. PIPES.

Hon. W. T. Pipes, chairman, replying to these addresses of welcome, said that with fine weather, good railways, good accommodation and cordial greetings he believed he was having a better time in the West than even Earl Grey or Lord Strathcona (laughter and applause). The preceding day he had had the pleasure of visiting Government House in Mayor Williams' motor car and



Residence of the Lieutenant-Governor, Regina, Sask.

had been greatly impressed by what he saw. His Honor had proved that trees would grow there, and, as for vegetables, they were the most magnificent he had ever seen. In the East the problem to be faced was that of tree preservation, here it was partly that, but chiefly tree planting. If the fire could be kept out of eastern forests they could be preserved and the streams would be kept in even flow, not becoming a succession of floods and low water, as was the case when the watersheds were denuded of their trees. He was particularly glad to see so many young people and teachers in the audience. He wanted to say what he had said to His Worship the Mayor when they were out driving the previous day. They passed a waggon in which were four fine healthy boys and he had told His Worship that that was the best crop raised on the plains (applause). He thanked them for their words of welcome.

TREE PLANTING ON THE PRAIRIES.

The morning session was devoted to papers and discussions on the planting of trees on the prairies, and the first paper was given by Mr. Angus Mackay, superintendent of the Dominion Government's Experimental Farm at Indian Head. Mr. Mackay spoke in part as follows:

"When the Experimental Farm was started at Indian Head in 1888 tree growing was considered one of the most pressing experiments. The Farm at that time and up to 1905 served the then territories of Assiniboia, Saskatchewan and Alberta, and, as the greater part of the settled portion of this vast territory was a treeless plain, every effort was made to find suitable hardy varieties that would grow in any part thereof.

Over 39,000 trees of thirty different species were obtained and planted in 1889 and 1890. A large portion of these were dead in 1900. Those hardy enough to stand and still living were Scotch Pine, White and Norway Spruce, Cedar, American Elm, White Birch, White Ash, Native Maple, Ash, Elm, Poplar and Birch. Since then Russian Poplars, American Cottonwood, Willows, Mountain Ash, Larch, Balsam, Poplar and Oaks have been added.

In the spring of 1893 tree distribution commenced from the Experimental

Farm, and each year since from 75,000 to 100,000 trees have been sent out free to settlers. Last spring the distribution to Alberta was discontinued on account of that province having two Experimental Farms from which trees may be procured, as well as from the Forest Nursery Station situated at Indian Head.

As maple and ash seed could be obtained in large quantities in the early years, and as these species were found very suitable for windbreaks and plantations, they were used almost entirely for distribution, as well as for planting on the Farm; and to-day they constitute the great bulk of the trees sent out, chiefly from the ease with which they can be propagated and the small loss in transplanting.

The Native Maple is a very unsatisfactory tree in some respects; its propensity to send out suckers from all parts of the trunk is a constant cause of trouble when grown singly; when used for hedge purposes, however, the suckering is an advantage.

The Ash may be considered one of the best trees yet obtained for the prairies, its only fault being its lateness in leafing out in the spring, and earliness in losing the leaves in the fall.

Native or American Elm for street or avenue purposes is the most satisfactory yet secured, its only fault being the liability to have branches broken in heavy wind-storms.

Dakota Cottonwood has so far proved a good avenue or shade tree on the Experimental Farm. This species is easily propagated from cuttings and in growth surpasses all others except the Russian Poplar.

Russian Poplar, which at one time gave promise of being a valuable species for this country, has for some years been injured by a fungus disease which makes the trunk unsightly and eventually kills the tree.

The Native Birch, which grows in many sections of the prairie, is well worthy of extensive growth, both for ornamental and commercial purposes. This is propagated from seed which is usually abundant each year. The Cut-Leaf Birch is quite hardy and is the most beautiful tree to be found in all Canada.

Mountain Ash, which in the early years was extremely tender, is now quite hardy and at all seasons one of the most beautiful trees that can be grown. In the summer with its white flowers, or in the fall with the large clusters of red berries, it is especially attractive.

In the Evergreen family, the Scotch, Jack and Stone Pines, Rocky Mountain, Norway and White Spruces, and Balsam Fir are quite hardy. Tamarack or Larch, both Native and European, is hardy, also nearly all the Arbor Vitæ (Cedar) family, but the latter are very slow growers.

In the twenty years of tree-growing on the Experimental Farm, cultivation has been the main reliance towards success. With a few exceptions water has never been used, even in the driest seasons. In all cases the land was prepared the year before planting—either by breaking and backsetting, if new, or by summer-fallow, if old. In no case has failure occurred with either of these preparations when the trees were in proper condition at time of planting.

The last week in April or the first two weeks in May have been found the best time to plant deciduous trees. Planting late in May has given better results with evergreen varieties, on account of the strong and warm winds prior to that time injuring the leaves or needles.

In propagating trees from seed, Maple, Ash, Elm and Birch are the only varieties attempted on a large scale. Elm ripens its seed early in June, and should be gathered at once and sown shallow as soon as dry. The other varieties come in about the time of wheat harvest, or early in September. Ash and Birch should be sown late in the fall or early in the spring, with no danger of being winter-killed. Maple can be sown in the fall with considerable risk of being killed, or can be sown early in May with safety. When fall sowing succeeds, as it has done for some years back, the growth of the young plants over the spring sown is very marked. A wise plan is to sow both in fall and spring."

Mr. Angus Mitchell, Assistant in the Tree Planting Division of the Forestry Branch, then read his paper on "Problems in Tree Growing in Southern Alberta and Western Saskatchewan," which is published in full elsewhere in this issue.

Mr. Mitchell's paper was followed by a brisk discussion, which was led by Mr.

G. B. Spring-Rice, of Pense, Sask., who took issue with Mr. Mitchell's theory regarding the chinooks and defended the older theory. Others who took part in the discussion were Messrs. A. Knechtel, A. P. Stevenson, H. L. Patmore (Brandon), A. Mackay, N. M. Ross and G. A. Rimington, of Penrith, Cumberland Co., England.

Mr. N. M. Ross gave some account of the experiments with different species of conifers at the Forest Nursery. They had found that Scotch pine were hardier than jack pine, the seed was cheaper and the tree stood transplanting well. The Norway pine had not been very successful. The Eastern jack pine was more easily handled than the Western. The main conifer for them was the white spruce. Asked to give his experience with regard to tamarack, Mr. Ross spoke of having transplanted some of these trees from Sewell, Man., and having, after they had had one year in the nursery, planted them out on the bare prairie, without any protection. In 1904 they had been eight inches high; in 1909 they were twelve feet in height. Twenty per cent. were lost in transplanting from the swamp to the nursery, but the subsequent loss was slight

During the morning a Resolution Committee was appointed, consisting of the following: R. H. Campbell, A. H. D. Ross, R. D. Prettie, J. P. Turner and T. N. Willing.

On the conclusion of the morning session the delegates adjourned to the auditorium of the City Hall and shared with the visiting British Association delegates the hospitality of the city at the luncheon.

Friday Afternoon.

On the convention resuming in the afternoon the Secretary read telegrams expressing regret at inability to be present from His Excellency the Governor-General, Patron of the Association; Lord Strathcona; Rt. Hon. Sir Wilfrid Laurier, Hon. President of the Association; Hon. Frank Oliver, Minister of the Interior, and Hon. Clifford Sifton, chairman of the Conservation Commission. Letters of similar import were also received from Mr. Thos. Southworth, Toronto, President; Senator Edwards, Ottawa, Vice-President; Senator T. O. Davis, Prince Albert, Sask.; Hon. Jules Allard, Minister of Crown Lands, Quebec; Hon. Frank Cochrane, Minister of Crown Lands for Ontario, Vice-President for Ontario; Hon. Sydney Fisher, Ottawa; His Grace Archbishop Bruchesi, Montreal, Vice-President for Ungava; Hon. R. P. Roblin, Winnipeg, Vice-President for Manitoba; Hon. W. C. H. Grimmer, Vice-President for New Brunswick; Mr. H. M. Price, Quebec, Past President; Mr. E. Stewart, Montreal, Past President; Mr. E. G. Joly de Lotbiniere, Quebec, Past President; Mr. W. B. Snowball, Chatham, N.B., Past President; Hon. W. A. Charlton, Toronto; Dr. B. E. Fernow, Dean of the Faculty of Forestry, University of Toronto; Mr. Gordon C. Edwards, Ottawa; Mr. Ellwood Wilson, Grand Mere, Quebec.

The first item on the programme was Mr. A. H. D. Ross's paper on "The Dominion Forest Reserves." He first noted the setting apart by the Forest Reserves Act in 1906 of the twenty-one reserves, of which six were in Manitoba, three in Saskatchewan, three in Alberta and nine in the strip forty miles wide in British Columbia, known as the Railway Belt. These areas were set aside (1) To provide lumber, fuel, ties, poles and other forest products required for the settlement of the country and the development of its resources; (2) To protect the headwaters of streams and regulate the flow of water in them for irrigation, transportation and industrial purposes; (3) To afford a natural shelter for the various kinds of birds, fish and game.

These reserves embraced areas as follows: Manitoba, 3,575 square miles; Saskatchewan, 740; Alberta, 185; British Columbia, 890; total, 5,391 square miles. It would require a special act of Parliament to withdraw any of the land from these reserves for settlement or other purposes, so that a great opportunity was afforded for the Government to protect and improve this property.

In the three prairie provinces the reserves were intended to supply homesteaders with building material, fencing and fuel, rather than to furnish wood for the lumber trade. In these three provinces there was a population of almost a million, and it would not be many years before it reached ten million. In the meantime the consumption of wood for building and industrial purposes would be enormous, and would require all the lumber at present grow-

ing on the reserves between Lake Winnipeg and the Rockies. There was not nearly enough timber land reserved to supply the needs of this great region. The obvious thing to do was to create more reserves and protect not merely the mature timber but also the young trees as carefully as if they were dollar bills. "If the floor of this room were covered with dollar bills," Mr. Ross went on, "he would be judged insane who would let a fire get started amongst them, yet this is the very kind of thing that is going on in the case of young tree growth." In Europe it was said "It is only Turks and Americans (including Canadians) who burn the forest." In the case of the Dominion Forest Reserves, however, it was the policy of the Forestry Branch of the Department of the Interior to do everything in its power to protect the timber from fire, to lessen the amount of waste incident to lumbering operations, to stop timber thieving, and so to manage the reserves as to secure continuous crops of timber from them. Other nations had been able not only to secure but actually to improve both the quantity and quality of the crop—so why not Canada? So far the great difficulty had been to secure men with the necessary technical training and administrative ability to take charge of the work. In the United States the technically trained men were snapped up by the Federal and State Governments and the lumber and pulp companies as soon as they graduated. With the recently established forest schools at the University of Toronto and the University of New Brunswick, it was hoped that men would soon be available for this work.

Mr. Ross then took up in detail the different reserves in the three provinces showing the location, size and character of each and mentioning the problems connected with them. He noted that, the rainfall being only about one-third that of Ontario and the average velocity of the wind almost exactly twice as great, it was a difficult matter to fight fire in the western reserves. The only way in which they could be protected was to patrol them summer and winter; to have efficient fireguards and have roads that would enable the rangers to get quickly from one part of the reserve to another. In 1908 one hundred and fifty miles of roads were made along the boundaries and through different parts of the reserves. This work should be continued.

In 1908 twenty-five squatters were removed from the Turtle Mountain Reserve in Manitoba and given land elsewhere. The same was true of Riding Mountain Reserve from which one hundred and twenty-five squatters had been removed. The removal of these required great tact on the part of the officers of the Forestry Branch, but without their removal it would have been folly to attempt to place the reserves under management. The great thing to be done now was to protect the young growth, have the dead timber removed and get tree growth started on the open spots. Citing the case of the Turtle Mountain Reserve where there was a bare patch of fifty-five square miles, Mr. Ross pointed out that it would cost $264,000 to plant this with nursery stock so that it will be necessary to let Nature do her own seeding or find some cheaper method than planting. In 1908 Mr. Knechtel tried the experiment of placing tree seeds in the long grass and covering them with sand. The experiment had so far been successful.

On the Spruce Woods Reserve east of Brandon, there had been planted 35,000 Scotch pine grown from seeds at Indian Head Nursery Station. From the swamps of the reserve thousands of young tamarack seedlings had been obtained and planted at Indian Head and were making remarkable growth. In 1908 forty bushels of spruce cones were collected there and used for planting on the different reserves.

The Duck Mountain and Riding Mountain Reserves were important as regulators of streams in Northern Manitoba and as game covers, being the home of elk, moose, black and cinnamon bears and smaller game.

Referring to the Saskatchewan reserves as a whole, Mr. Ross noted that the area was only 740 square miles, poorly timbered, containing less than 60,000,000 feet of saw timber and about 700,000 cords of wood. That was not much for a population of 350,000. He asked if the people should not begin to agitate for the creation of more forest reserves in the northern part of the province. To create timber land by planting nursery stock would cost a million dollars for six townships. If

Mr. Knechtel's experiments were successful it would cost a million dollars for twenty townships. Would it not be better to reserve the timber land now existing and spend the money in increasing the planting which nature has done?

Mr. Ross called attention to the watershed known as the Eastern Slope of the Rockies. This contained 8,224 square miles, most of which was wholly unsuited for agriculture. He quoted from a report of Inspector MacMillan, who asked if common lumber cost $22 per M. in the prairies now with a million population, what would it cost when there is a population of ten million, when most of the forest land had been cut and burned over? The coal mining industry of Alberta would require forty-five billion feet of mine props, the product of nine million acres for sixty years. This said nothing of railways, settlers and other requirements. These facts, along with the need of irrigation, show the need for turning the Eastern Slope into a Forest Reserve before it was too late.

Photo by A. Knechtel

Picnic Party on shore of Fish Lake, Moose Mountain Forest Reserve, Sask. (August, 1909)

Discussion of Paper of Mr. A. H. D. Ross.

In opening the discussion on the paper, Mr. R. H. Campbell, Dominion Superintendent of Forestry, pointed out the importance of the reserves to the country and to every individual in it. Some people were apt to think of the reserves as an academic subject; but if it were considered seriously any one must come to the conclusion that the question of timber supply and forest reserves was one of great interest to all. There was no one who did not depend upon the products of the forest for conveniences and comforts of all kinds. In spite of all substitutes, more wood was being used to-day than ever before, and in spite of substitutes that necessity would be constantly increasing. When one came to look into the matter of wood supply the prospect was not reassuring. In Europe they were importing much more than they exported. Germany, the foremost country in the world in regard to forestry, in spite of what she produced, was an importing country. The same was true of France. In England the whole of the timber used was imported. Almost every country in Europe is an importing country. Sweden Norway and Russia (including Finland) were the only exporting countries. The latter was the only one in which there was any possibility of increase of exports. Sweden and Norway were

reducing their exports and soon would have no timber to send out. There was a balance of from two to three billion feet per year which Europe must get from outside. The United States had a stand of about two thousand billion feet and was using up about one hundred million feet per year. Now, if one divided a hundred into two thousand, he would see that the United States would not travel very far before it came to a shortage. When that time came the demands in our country would also have greatly increased. Canada's present production of timber was not more than one-tenth that of the United States, but if she reached, as she would reach before long, a population such as the United States had, her forests would not last very long. Canada should begin at the present time to preserve what she had, and the establishment of forest reserves was a step in that direction.

Fire was the most serious menace to the forest; this year, however, but one serious fire, that at Ile la Crosse, had occurred. The forests were meant to be used, and would produce more if properly handled. "The Pines" reserve could, by proper management, be made to give again a supply of fuel to the surrounding country. The reserves were also a source of water supply, and, in the case of the Cypress Hills, of hay. Some, such as the Moose Mountain Reserve, were also valuable as pleasure resorts.

Mr. E. F. T. Brokovsky, of Battleford, noted the fact that along Turtle River and Lake, northwest of Battleford, a large area of timber existed, which ought to be reserved. Years ago he had got timber from there for bridge-building, and the C. N. R. were depending on the district for ties for their line to Jackfish Lake and beyond.

Mr. Knechtel gave a resume of the work done on the reserves this year. In the Turtle Mountain Reserve a road twenty-five miles long had been made along the southern boundary to serve as fire line and for transporting men, etc. In the Sprucewoods Reserve the C. N. R. had ploughed a fire guard on both sides of their right-of-way, and the C. P. R. on the south side of theirs. Fire protection was the great need on the reserves, planting being comparatively unimportant. A road was being made entirely round the Riding Mountain Reserve, others around the Duck Mountain and Lake Manitoba West Reserves. Similar work was being done on the Cypress Hills Reserve. There was an immense amount of timber on the eastern slope of the Rocky Mountains to be protected. The forest should be cleared of all dead timber and debris. This would prevent fires almost entirely and could be done at a cost of $5 per acre, while replanting would cost $12 per acre. The settler's lumbering was the worst in the world. The speaker and Mr. W. I. Margach, of Calgary, were devising a scheme of cutting over a section under forestry methods—e.g., cutting low stumps, taking out tops, destroying debris and cutting only mature timber—and so ascertaining the actual cost.

Mr. W. A. Davis, of Dauphin, Man., Chief Forest Ranger for Manitoba, urged extensions to the Porcupine and Duck Lake Reserves. On the Riding Mountain Reserve, he remarked, 187 miles of road were cut in 1908 and 200 more would be completed this year.

Mr. Wm. Sifton, Ranger on the Porcupine Reserve, pointed out extensions which should be made to the Porcupine Reserve. He protested against allowing construction companies to cut timber, on account of the waste they made—a waste not made by the manufacturing lumbermen.

The Protection of Game.

Mr. J. P. Turner, Secretary of the Manitoba Fish and Game Protective Association, was then called on for the first paper on this subject. After speaking at some length of man's battle against primitive nature, his consequent destruction of the wild things, plant and animal, and the progress in civilization which followed this first stage, Mr. Turner alluded to the over-cutting of Canada's forests and the evil consequences that must ensue, and continued:—

Intimately associated with it (the forest) and only second in importance to the question of the perpetuation and reproduction of our forests stands the question of the preservation of wild life. It might be said that the most striking and melancholy feature in connection with the wild animals and birds of America is the rapidity with which they have vanished; and in view of the fact

that their disappearance would mean the loss to us of one of the most valuable and essential benefits provided by Nature their preservation becomes a duty requiring our every attention and effort. Sad to say, any energy put forth in the endeavor to protect wild life is too often looked upon as little more than the worthy agitation of a few biased enthusiasts; but the matter of the protection of game (and with it that of all beneficial species of animals) means far more to the state than the mere curtailing and lengthening of the open seasons for shooting, subject to the whims of a few present-day sportsmen.

Value of Game Preservation to Agriculture.

In the United States the preservation of game is now being looked upon almost wholly from an agricultural point of view. Large appropriations of money have enabled the Department of Agriculture to make the fullest scientific enquiry as to the value of all wild life; and this has proven in the most conclusive manner that the whole question is one of the greatest economic value. The work achieved in their Bureau of Biological Survey has been of marked assistance in providing information that applies to this country also, and is well worthy of adoption by our own government. It has been shown that "weeds and insects cost the farmers of Canada millions of dollars annually, both in direct losses and in expenditures for labor and material necessary to protect their crops. Anything, therefore, which tends to reduce the number of weeds or to check the ravages of injurious insects is a direct benefit. Among the most useful natural agents in checking such losses are insectivorous and seed-eating birds (many of which are game birds); and the importance of their preservation, while difficult to measure in dollars and cents, is self-evident, since it may mean the difference between large profits and heavy losses." The fecundity of insect pests, to say nothing of rodents, is amazing and appalling; and it has been oft repeated by those who have given the subject the most earnest study, that without birds human life could not long exist upon the earth. An estimate of the present damage to agriculture in the United States from insects and rodents alone places the loss at eight hundred millions of dollars. With such facts as these before us it is possible to grasp some idea of the importance to our national interests that birds should not be needlessly destroyed, and that they should be given every opportunity to remain and increase in our midst.

Revenue to the State from Game.

That the systematic protection of game may be the means, both directly and indirectly, of developing the pecuniary resources of a country is an assured fact. In our game supply we possess an asset of the greatest commercial value, and one from which a very considerable source of revenue may be derived. As an instance, not much more than a score of years ago, the wild game in the State of Maine had been depleted to an extent almost bordering on extermination. A few intelligent, far-seeing men took it upon themselves to reclaim this lost heritage, under government patronage, with the result that to-day the State possesses not only a bountiful supply of game, but derives therefrom one of its most substantial revenues. In 1904 the license fees from non-residents who visited the State to hunt game amounted to over $25,000, and a fair estimate of the money spent in employing guides alone amounted to $307,000. This revenue, which may safely be said to be a permanent one, has thus been summarized by Senator Frye: "In all times of business depression and distress, financial panics and consequent unemployment of labor, so seriously affecting the country, the State of Maine has suffered much less than any other state in the American Union; and this is mostly, if not entirely, due to the large amount of money left with us by the fishermen, the summer tourist, and the fall hunter—the seeker after change, rest and recreation."

Necessity for Game Refuges.

The question arises, how are we to solve the future preservation of our wild animals and birds? All expedients and devices of late years in the form of restrictive laws must in the end prove to be inadequate. Sooner or later the development of the country will reach a point when there will be no room, under existing conditions, for our larger mammals and many of our birds. How

is the present vandalism against Nature to be checked? There is but one final solution. As in the case of our timber supply, the wild life of this country can only be permanently handed down in refuges and protected areas established throughout the length and breadth of the land.

Canada's Game Preserves.

Fortunately the Government of Canada has launched into the forestry question with energy and far-sighted intelligence; and fortunately the growth of sentiment in favor of providing more adequate protection for our game has already resulted in the establishment of several sanctuaries for wild life. In the United States fifty-one federal bird reservations and twelve state and national game preserves have been created. In Canada we have no reservations providing specially protected breeding-grounds for birds; but seven reserves exist for the protection of large game and incidentally smaller varieties; and three large tracts are now set aside for captive bison. Two areas of forest land will likely be set aside immediately, one in the Rainy River country bordering on the State of Minnesota, and one in the Moose Mountains of Southern Saskatchewan. No steps have yet been taken to provide a haven of refuge for the large herd of wapiti or elk in Northern Manitoba. In the district of the Riding Mountain Forest Reserve lingers the second largest herd of wapiti in the world; and only the establishment of a game refuge in that quarter will prevent the ultimate extinction of this magnificent deer in Canada.

Every territory and every province should have animal and bird refuges, and not till this has been accomplished can it be said that we have sufficiently guaranteed the perpetuation of animated Nature around us.

Agitation Needed.

The grand object to which such organizations as the Canadian Forestry Association, the National Association of Audubon Societies, the National Conservation Commission and others have pledged themselves is the direct outcome of a desire, as yet all too limited, to insure the productive, commercial and æsthetic necessities of the future. The people must be further awakened to the true state of affairs. A great warning must be uttered broadcast, and our legislatures given every assistance towards accomplishing the permanent preservation of our natural wealth. Above all, it must be forcibly brought to the minds of the people of this country, that if her citizens expect to enjoy the fruits of prosperity in the future, the laws of Nature, the laws of mankind and the laws of the state must be obeyed. And let us not forget that if the time should ever come when the wild creatures should be exterminated from our land it would exact a price which would be beyond the power of humanity to satisfy.

Notwithstanding the fact that Canada still possesses an enormous forest area, that the range of her cultivated lands increases annually and that thousands upon thousands of her rich acres have yet to know the plough, it seems all too evident that we have already arrived at the opening of a new period and that upon this generation must rest the responsibility of saying on what terms and in what localities that great natural heritage which has come down to us from the past shall be turned over to the generations to come after us.

Mr. T. N. Willing, Chief Game Guardian of Saskatchewan, also gave a paper which will be found on page 137 of this issue of the Journal. Mr. Willing noted the decrease in the numbers of game animals in the province and the causes of this, also the reasons for the preservation of game. He advocated a close season for all birds in spring, the prohibition by landowners of hunting on their enclosed or cultivated lands and the establishment of game reserves, especially on the forest reserves. The Government also, he thought, should conduct experiments in the propagation of game on the forest reserves. The killing of timber wolves, coyotes, weasels and other animals inimical to game should be encouraged and the question of preserving the beaver and the antelope should have special attention.

Some discussion then took place on the papers, a number of instances of the fecundity of the beavers and of groves cut down by them being cited.

Mr. H. L. Lovering, of Regina, speaking from the standpoint of the nurserymen, strongly commended the

Government tree-distribution scheme.

Mr. Jas. Lawler, Secretary of the Association, read a letter from Mr. F. C. Whitman, of Annapolis Royal, N.S., dealing with deforestation and its effect, the danger and damage to timber from fire, the survey of the Nova Scotia forests and other topics of interest.

RESOLUTIONS.

The Committee on Resolutions then presented its report, which was considered clause by clause and adopted. The resolutions were as follows:—

(1) Resolved, that this Convention call the attention of the governments and the public to the danger resulting from prairie and forest fires and would urge that the utmost care be exercised by every person handling fire in the open, and that the laws and regulations for the prevention of fire be strictly enforced; further, that the provisions of the Railway and Fire Acts and of the regulations of the Railway Commission in regard to the plowing of fire guards, the removal of inflammable material from the right of way and the proper equipment of locomotives with efficient appliances for the prevention of the escape of fire, be enforced by a thorough system of inspection; that the system of a patrol by a staff of fire rangers be extended to all the forested districts; that in the opening up of railroads or other roads or line through a forested district or the conduct of lumbering operations in the vicinity of such roads the clearing of debris should be made compulsory—Carried unanimously on motion of Messrs. W. Sifton and E. F. T. Brokovski.

(2) Resolved, that as the preservation of game birds, animals and fish throughout Canada as well as that of all beneficial species is intimately associated with the question of the conservation of forests, and that as the wild game of Canada is in danger of extermination in many localities where its preservation should be assured some further steps be adopted by the association towards furthering public sentiment in this respect by the formation of a game protective branch of the association or the election of a game protective committee.—Unanimously carried on motion of Mr. J. P. Turner, seconded by Mr. F. C. Tate, M.L.A.

(3) Resolved, that in view of the diminution in numbers of game, both large and small, throughout Western Canada, this association approve of a policy of greater activity on the part of the Forestry Branch in availing themselves of the powers conferred on them for the protection of game on forest reserves and consider the advisability of setting aside additional lands to be utilized as game refuges in various sections of the prairie provinces.—Moved by Mr. T. N. Willing, seconded by Mr. J. P. Turner, and carried unanimously.

(4) Resolved, that this convention express their support of the policy of establishing forest reserves on watersheds and lands unsuitable for agriculture for the purpose of protecting the water supply, furnishing wood products and providing places of recreation for the public and would recommend that an examination of all public lands for the purpose of selecting such areas should be made as speedily as possible; that, while commending the adoption of this policy in so far as it has been carried out by the Dominion and Provincial authorities, this convention would urge that its operation be extended so as to embrace all lands which are suitable only for tree growth.—Moved by Mr. A. P. Stevenson, seconded by Mr. John Caldwell, and carried unanimously.

(5) Resolved, that this association tender its appreciation of the work being done in tree planting and horticulture by the Canadian Pacific Company at its station grounds in various places and the experiments being made in tree planting in those parts of the West where it is most needed and would direct the continued notice of the settlers and the travelling public to the future value of those experiments.—Unanimously carried on motion of Messrs. G. B. Spring-Rice and A. Mackay.

Mr. H. L. Patmore, of Brandon, brought before the convention a resolution proposing that the convention endorse a change in the provisions of the homestead law, so as to provide that a homesteader who should plant to forest trees an area of his farm should be entitled to his patent. In support of the resolution Mr. Patmore said that he thought the growing interest in tree-growing would make the change acceptable to intending homesteaders. Mr. N. M. Ross spoke in

opposition to the motion. Similar legislation in various states had failed to encourage tree-planting to any great extent, he said, while it gave great opportunities for attempts at fraudulent entry. A similar scheme had been tried in Canada, too, and had been unsuccessful. Few homesteaders, moreover, could or would take the time to plant up such an area during their first years on their farms. Hon. W. R. Motherwell endorsed what Mr. Ross said, and Mr. A. P. Stevenson also spoke against the motion, which was finally withdrawn.

A paper by Wm. Pearce, Esq., Calgary, Vice-President for Alberta, on "The Conservation of National Resources" was also put in, references to which will appear in future issues of The Forestry Journal.

Resolutions of thanks were also put and carried to the following: The Lieut.-Governor, Regina City Council, Regina Board of Trade, Hon. Walter Scott, Hon. W. R. Motherwell, Hon. J. A. Calder, the Railway Companies and the Press.

Hon. W. T. Pipes was then asked to leave the chair, and Hon. W. R. Motherwell, seconded by Mr. A. P. Stevenson, moved a resolution of thanks to him for attending the convention (no doubt at some personal sacrifice) and for presiding. The motion was put by Mr. R H. Campbell and unanimously carried amid hearty applause. Hon Mr. Pipes made a brief reply, after which the session adjourned.

Friday Evening.

Friday evening was devoted to lectures by Messrs. N. M. Ross and A. Knechtel, each of which was profusely illustrated with lantern slides. The chair was occupied by His Worship Mayor Williams, and the auditorium, in which the lectures were held, was well filled with appreciative listeners.

Mr. Ross dealt with the work of the Forest Nursery Station. The growing of the deciduous trees was first taken up, and the various steps in their culture, including the sowing and cultivation, and the processes of digging, bundling, heeling-in, packing and sending out in the spring described. Views were shown of a homestead before planting and of the same place some years later, also of plantations of various ages, up to seven or eight years. The coniferous trees and their culture were then dealt with. Mr. Ross described at length the structure of the cones and of the seed, the extraction of the seed from the cones and the preparation and care of the seed-beds. The transplanting of the young conifers was described and the dangers to which they are subjected, e.g., sunscald, to prevent which large banks of snow must be held on the trees during winter. The tamarack was also spoken of, the lecturer commending it as the most valuable conifer for prairie planting, quickly attaining a size which made it valuable for fuel and posts and would ultimately make it of use in producing ties and poles. The development of the grounds at the Forest Nursery Station from bare prairie in 1905 to their present beautiful condition was also well illustrated.

Mr. Knechtel's lecture was of a more general nature. He dealt with the original forested state of the country and the dangers of over-clearing, and pointed out the uses of forests in preserving stream flow, retarding the evaporation of snow and retaining the moisture, and so lessening the danger from spring floods. Other uses of the forest were the preventing of erosion, the breaking of the force of the wind and their sanitary benefits. The danger to the forest from fire and the necessity of fire protection were enlarged on and the work of the forest rangers described. The necessity of reproduction and the destructive effect on it of fire were enlarged on. The planting of forest trees and the subsequent care, thinnings, etc., were described, and also the various parts of a lumbering operation. The lecture concluded with a number of scenes in European forests and of autumn leaves.

Excursion to Indian Head.

The second day of the convention, Saturday, September 4th, was taken up with a visit to the Forest Nursery and Experimental Farm at Indian Head. About fifty took in the excursion. Ald. Sinton representing the Regina City Council and Messrs. P. McÄra, President, and H. C. Lawson, Secretary, the Board of Trade.

On arrival at Indian Head the party was conveyed in carriages to the Forest Nursery Station, where they assembled in one of the large packing sheds, and

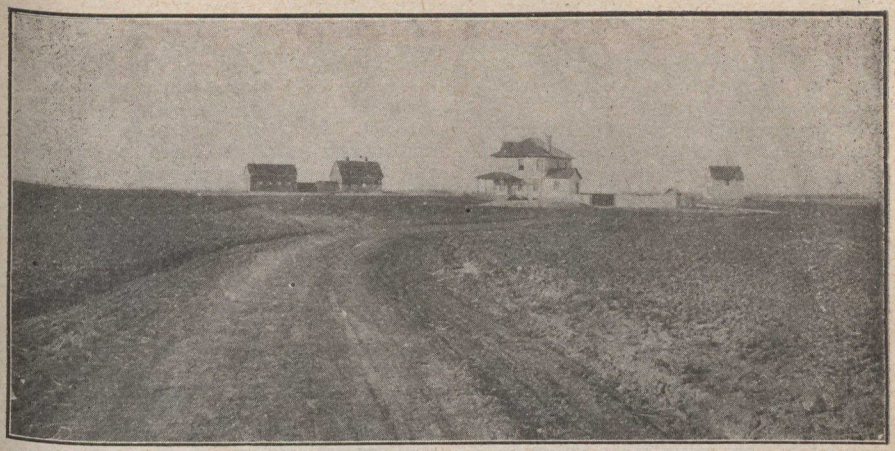


Photo by N. M. Ross

Forest Nursery Station, before planting, autumn, 1904.

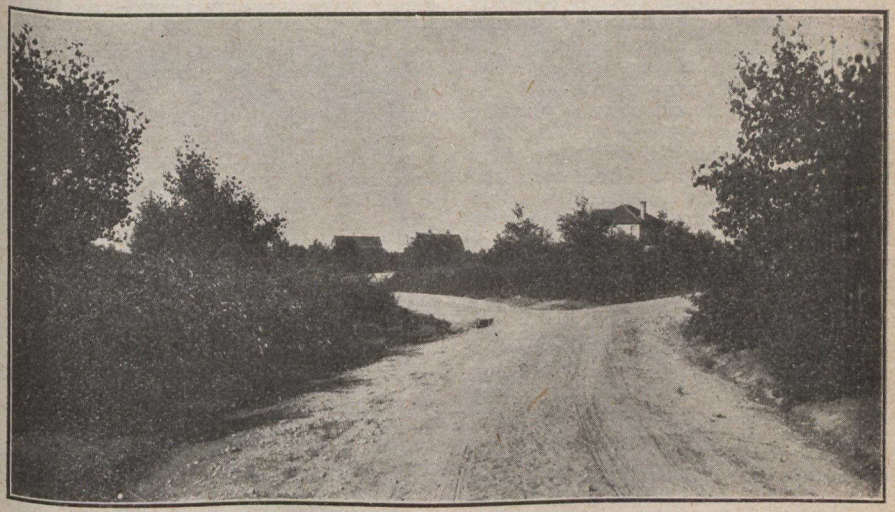


Photo by N. M. Ross

Forest Nursery Station, autumn, 1908.

The photographs from which the above two cuts were made were taken from almost the same spot. The views are taken looking up the main drive toward the house and buildings, and show the wonderful progress that was made in four years of planting and management.

Mr. R. H. Campbell, Superintendent of Forestry, was asked to say a few words to the assembled guests.

Mr. Campbell said he supposed he had been called upon because he had general charge of the tree planting work and he gave them all a hearty welcome to the Nursery Station. This work of growing and sending out trees loomed large to those interested in the work of placing trees on the prairies. Perhaps it looked larger to those in the work than to the general public, yet there was no doubt the people were awakening to its importance, and the fact that the convention had come down to visit the Nurseries showed how much the members were interested. Tree planting was not solely the work of those directly engaged in it, but it was the work of the whole people for the benefit of the country at large. It was the people's work for the improvement of their conditions and surroundings, and its aim was the advantage of the Dominion of Canada. They would now pass through the grounds to see what was being done in the way of testing the different varieties, and in propagating and distributing those found suitable for the different sections of the west. Without flattering anybody he felt sure they would say when they had seen the Station that Mr. Norman Ross had carried on his work well, and that with the aid of his assistants the Nursery was doing a good work and was a credit to those in charge. (Applause).

Mr. Norman M. Ross was then called upon and explained briefly what the visitors would see. The Nursery Station was bare prairie in 1904 and everything they would see had been grown and developed since that time. In connection with the different branches of the work certain difficulties had arisen, difficulties that explained the conditions of the trees in some sections and in the conquering of which much valuable information was being gained for the guidance of those now planting trees on their own places. On a place like this the work, much of it, must necessarily be done by machinery and as yet there was no machinery that would do certain parts with full success. For instance, all knew how difficult certain tree seeds were to plant by machinery. No machine existed that would fill the bill, but they had met with fairly good success by using an artificial manure spreader. Mr. Ross then ran over the different varieties growing in the nursery and explained briefly the characteristics of each and why it was suited or unsuited for certain conditions. He explained that in the first quarter-section where they stood there were the seed beds and nurseries and shipping sheds for sending out the stock to applicants. The quarter-section adjoining was being devoted to permanent plantations where exact record would be kept of the cost of planting and the rate of growth, so that settlers could be told exactly what it cost to raise the different kinds of trees per acre, and therefore the possibility shown of growing trees for fuel, fence-posts and the like.

The visitors were then conducted over the nursery and seed beds, seed house, garden, grounds and experimental plots were closely examined. The work done by Mr. Ross and his assistants was highly praised, as it has every reason to be.

At the conclusion of the visit to the Forest Nursery, the visitors were taken back to the Imperial Hotel, where they were entertained to luncheon as the guests of Regina's City Council and Board of Trade. After a very enjoyable luncheon had been partaken of Mr. A. H. D. Ross moved a vote of thanks to their hosts, not only for the luncheon and the enjoyable trip to Indian Head, but for all the courtesies extended to the delegates throughout their visit. This was duly seconded and carried amid applause.

Mr. P. McAra, in response, said that thanks were due in quite the other direction, and Regina thanked the association very sincerely for the honor conferred on the city by the association's meeting in it.

Mr. Ross also moved a vote of thanks to Messrs. N. M. Ross and A. Mackay for the courtesies extended to the party on the occasion of their visit to Indian Head. Mr. F C. Tate, M.L.A., seconded the motion and paid special tribute to Mr. Mackay for his services to Western agriculture. Messrs. Ross and Mackay spoke briefly and fittingly in reply.

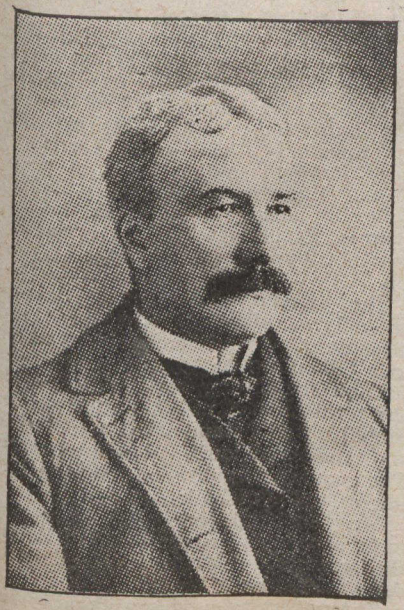
After luncheon the party was driven to the Experimental Farm, where the afternoon was pleasantly and profitably spent. Mr. Mackay and his assistants

looking after the visitors most hospitably.

With the return of the party to Regina in the evening concluded one of the most pleasant and successful conventions ever held by the association. Much of the credit for the success of the convention is due to the painstaking and unremitting work of the Secretary, Mr. Jas. Lawler, whose initial effort in organizing the association's conventions has thus been crowned with success A goodly share of the credit is due also to Mr. H. C. Lawson, Secretary of the Regina Board of Trade, who ably assisted Mr. Lawler in his work.

Hon. W. T. Pipes.

Despatches of October 8th announced the sudden death, in Cambridge, Mass., on the previous day, of Hon. W. T. Pipes, Attorney-General of Nova Scotia and Vice-President of the Association for that province. The announcement will be heard with regret by members of the Association, especially those who were in attendance at the Regina meeting, where Hon. Mr. Pipes made so acceptable a chairman. Hon. William Thomas Pipes was born April 15th,



1850, at Amherst, N.S., and educated at Acadia College. After some years spent teaching school, he entered the legal profession and was called to the bar in 1875, and practiced in Amherst, being created a Q.C. in 1890. First elected to the provincial legislature in 1882, in the fall of the year he became Premier and continued so until 1884, remaining in the legislature for some time longer. In 1898 he was called to the Legislative Council and became a member of the Murray administration in the same year. In 1905 he became commissioner of public works and in 1907 was appointed attorney-general. The forest survey of Nova Scotia, partially carried out this summer by Dr. B. E. Fernow and his associates, which is the first complete forest survey that any province of the Dominion has yet undertaken, lay within the sphere of Hon. Mr. Pipes' department and met with his cordial co-operation and support.

On his way to the Regina meeting the Secretary delivered an illustrated lecture before the Board of Trade of Port Arthur, and on the way back delivered similar lectures before the Board of Trade of Kenora and in the Collegiate Institute at Fort William. A good deal of interest was aroused by these lectures and it is intended to hold a series of such meetings during the coming winter in different parts of Eastern Canada. Members who desire to make arrangements for lectures in their locality should communicate with the Secretary, 11 Queen's Park, Toronto, as early as possible.

Forestry at the British Association Meeting.

Before the Agriculture Section of the British Association for the Advancement of Science (which met in Winnipeg, Man., on Aug. 23rd to Sept. 1st), the morning of Aug. 31st was devoted to the reading and discussion of papers relating to forestry topics.

Of these Prof. Somerville's paper, of which it was remarked that "nothing more masterly, or showing a broader grasp of world conditions, has been presented to the Agriculture Section this year" is given in full elsewhere in this issue.

A paper on the insects affecting Canadian forests, prepared by Prof. W. Lochhead, of Macdonald College, Ste. Anne de Bellevue, P.Q., was read, in his absence, by Prof. Snell, of the same institution.

Prof. Lochhead deplored the fact that no comprehensive survey of Canada's timber resources had been undertaken by any of the governments, either Dominion or provincial, and that the matter was thus largely problematical and they had to rely for data as to the relative importance of insect pests upon data gathered by U. S. experts in the forests of that country and proceed by inference after allowing for differences of climate and conditions. The observations of forest rangers and timber cruisers were another source of information, but these were meagre and unreliable.

"The Forests of Canada" was the title of a paper written by Mr. R. H. Campbell, Superintendent of Forestry, and read by Mr. A. Knechtel. The writer divided the forests of Canada into five groups, namely: (1) those of southern Ontario; (2) the forests on the southern slope of the Laurentian watershed of Ontario and Quebec; (3) the forests of the Maritime Provinces; (4) the sub-arctic forests of the Hudson Bay and Arctic drainage basins, and (5) the British Columbia forests.

The first of these divisions had comprised an area of 12,000,000 acres; the hardwood forests that had covered it were now gone forever. The second area, the great pine district, had comprised 100,000,000 acres of forest, sometimes of pure white pine, sometimes of white pine mixed with spruce, balsam, fir, hemlock and Norway and jack pine. In the province of Ontario it was estimated that twenty billion feet of this was left; this was the only official estimate of the region.

Of the Maritime forests the following was the estimate: Southern Quebec, 5,000,000 acres; New Brunswick, 8,000,000 acres; Nova Scotia, 4,000,000 acres. Most of the timber was coniferous.

The sub-arctic forest belt had a length of three thousand miles and an average breadth of two hundred miles. Eight species made up this forest, namely, white and black spruce, Banksian pine, tamarack, aspen and balsam poplar, paper birch and balsam fir. There was an enormous quantity of pulpwood in the district.

The forests of British Columbia were estimated to cover 182,000,000 acres, and contained, according to an unofficial estimate, three hundred billion feet of saw-timber and probably (together with the forests of the Yukon Territory) three hundred million cords of pulpwood. Many species found in British Columbia (e.g., Douglas fir, yellow cypress, Pacific yew and Sitka spruce) were not found elsewhere in the Dominion.

The present production of Canada annually was about ten billion feet board measure of all wood products, of which four billion would be timber of a size suitable for sawing into lumber, while the total area of merchantable timber probably had a stand of five hundred to six hundred billion feet board measure. The quantity of pulpwood was large and might equal one billion cords.

Mr. Campbell concluded by urging more care in the preservation of forests that remained and the afforestation of denuded areas.

The papers aroused considerable discussion, among those taking part being Mr. T. A. Burrows, who gave some interesting particulars as to Canadian methods of lumbering.

The Outlook for the World's Timber Supply.

By Professor W. Somerville, Oxford University, England.

(Read at the meeting of the British Association for the Advancement of Science, Winnipeg, Man., Aug. 31st, and published by permission of the author).

During the past twenty years, but more particularly during the past ten or twelve, much attention has been given to the question of the world's timber supplies, and I think I may say all who have critically examined the position have come to the conclusion that the outlook is not reassuring.

The international trade in timber can only be described as colossal. Britain possesses a very small area of woodlands, and her structural timber is practically all imported. On the average of the five years ending with 1893 her bill for foreign wood was some eighteen millions sterling, while fifteen years later—namely, on the average of the five years ending with 1908—it exceeded twenty-seven millions, an increase of more than fifty per cent. To this must be added the imports of wood products (cork, caoutchouc, rosin, bark, turpentine, wood pulp, etc.), which fifteen years ago were valued at six and a half millions, but now total seventeen millions sterling. Germany possesses nearly thirty-five million acres of forests, as compared with Britain's three million acres, and yet she pays annually some twelve millions sterling for foreign timber. The combined imports of timber into France and Belgium also aggregate about twelve millions sterling, while Italy, Spain, Portugal, Denmark and Holland are also large importers.

In Europe the chief countries with surplus supplies are Sweden, with annual exports valued at about fourteen millions sterling; Russia and Austria-Hungary, each of which receives about eleven millions sterling per annum for exported wood, and Norway, whose timber-exports exceed four millions sterling.

Outside Europe the only two countries that export timber to a large extent are Canada and the United States; the annual exports of the former being valued at about eight millions, while those of the latter exceed twenty millions. Both countries are also large importers of wood, the United States paying annually over twenty millions sterling for wood and wood products, the corresponding figure for Canada being not much short of two millions.

Notwithstanding the fact that iron, concrete and other substances are being largely used as substitutes for timber, the consumption of the latter is steadily and rapidly increasing, and the question comes to be: Can the supply be indefinitely maintained? In any particular area of woodland it is comparatively easy to estimate what the annual growth amounts to, and if no more is annually removed than is annually produced it is evident that the supply will be maintained in perpetuity. But it is impossible to apply any such simple method of estimation to the forests of the world, for the reason that their area, growing stock and productive capacity are not known with sufficient definiteness. The method can, however, be applied to single countries where systematic forestry has been practised for a long period. Anyone familiar with the conditions in France or Germany, for instance, knows that there will be no falling off in the output of timber of these countries. Their woodland areas have been long subjected to systematic management, and the crops that they bear are almost as much the result of human activity as a crop of wheat. A similar condition of things prevails in Austria-Hungary, Italy and Denmark, and is probably not materially different in Spain, Servia and Roumania.

The European countries regarding which much uncertainty prevails are exactly those on which the world's international market mainly depends for supplies, namely, Scandinavia and Russia. The timber exported from these countries is practically all supplied by natural or primeval forests, that is to say, it is not the result of cultural or administrative methods. It has cost nothing to produce, and is as much a free gift of nature as coal, iron or limestone. Such forests have been exploited

with prodigal activity, and, until comparatively recently, no steps have been taken in these countries to ensure the continuance of the forests on the denuded areas. When a coniferous forest is felled it is an easy matter to secure the presence on the same area of a young wood of the same or of an equally valuable species. This may be done either by arranging the fellings in such a way that the denuded ground, while still in a receptive condition, is naturally supplied with seed, or by artificially sowing or planting the area. But in Scandinavia and Russia no such steps have been taken in the vast forests from which much of Britain's supplies are drawn. I say deliberately "have been taken," for steps are now being taken, and will no doubt be taken to a greater extent in future, to secure better results, but the vast areas of forest land that have already been cleared are at present almost a wilderness. Even under improved methods of regeneration, one must not forget that in the great forest lands of Sweden and Russia, situated as they are in high latitudes, tree growth is very slow, so slow indeed that a pine or spruce is no larger at 150 years of age than would be the case in Central Europe at half this age.

[1] Professor Schwappach, of Eberswalde, as a result of his visit to the forests of Russia in 1901, has supplied us with a vivid picture of the condition of things in that country. From his report I may make the following translation:

"It is to be noted that in these northern districts, where the temperature is low and the air moist, the soil is concealed beneath a thick layer of raw humus, which in spruce forests bears a covering of moss, and, in pine woods, of blaeberry and similar plants. When the trees are felled it takes at least six to eight years before the humus is sufficiently decomposed to permit of seedling pines and spruces establishing themselves. In the interval the birch and aspen occupy the ground in enormous quantities, while grass and other herbaceous weeds form a matted mass on the surface. As no attention is given to protecting such young conifers as may have sprung up they are rapidly choked out by the vigorous competing vegetation. Where the soil is wet the formation of peat begins directly a forest is cleared; Polytrichum and Sphagnum rapidly occupy the surface, and on such an area young pines are scarce, while spruces are entirely absent. Further south, between St. Petersburg and Moscow, peat does not form so rapidly, but for some reason or another natural reproduction is so rare that the most diligent search only resulted in finding a pine seedling here and there. Aspen and birch, on the other hand, spring up quickly and grow vigorously." There are signs of the State doing more in the future than in the past to secure regeneration of the denuded areas, but there would appear to be no doubt that from the areas already cleared practically no second crop can be expected.

M. Mélard, the distinguished French forest statistician, in the review of the world's timber supply that he presented to the International Congress of Silviculture in Paris in 1900,[1] points out that "In Russia population is increasing at a faster rate than in any European country," and continues, "When in the middle of the twentieth century Russia will have a hundred and fifty million of inhabitants, when its smelting furnaces, cotton mills and industrial enterprises of all kinds have extended as far as we have every reason to expect, its timber exports will have ceased, and it will be fortunate if Russian forests have been so carefully managed as to supply her own local wants." Speaking at a Conference held in London in 1907 Sir William Schlich pointed out that although timber-exports from Finland had increased of recent years, those from Russia proper had actually decreased, a state of things that seems to confirm M. Mélard's forecast of seven years previously. With regard to Finland Schlich said:

"It is asserted by the Forest Staff of Finland that already the increment of the Finnish forests is smaller than the annual cuttings by twenty per cent, which is not a very cheerful prospect."[2]

I regret that I have no Schwappach, Schlich or Mélard to quote in regard to the condition of things in Sweden, but at p. 620 of the volume on the industries of that country, edited by G. Sundbörg,

1 Schwappach. Forstliche Reisebilder aus Russland, Zeit. f. Forst und Jagdwesen, 1902.

1 English Trans. by Fisher in Trans. Eng. Arb. Soc. Vol. iv. p. 386.

2 Report of a Conference on the subject of Afforestation, 1907, p. 13.

and issued by the Central Bureau of Statistics in 1904, it is stated that 106,000,000 cubic feet of timber are being annually cut in Swedish forests beyond the annual increment. If this official information be correct, and I have no reason to doubt it, it would appear that Swedish timber exports cannot be indefinitely maintained at their present high level. I cannot pretend to know much about Sweden from personal examination, but last year I travelled for about a thousand miles in the country and endeavored to learn what I could. The impression left on my mind was that in much of the country the rock is hidden by but a thin covering of soil, and that the growth of trees is very slow. Moreover, when a forest is felled, the soil suffers severely from washing by the heavy rains, and where drainage is defective there is the same tendency to the formation of peat as Schwappach noticed in Russia. It was also evident from my cursory inspection of the country that no attempt is being made to continue the forests on much of the area hitherto under wood. Dairy farming is advancing at a great rate, and herds of cows could be seen grazing on much of the disafforested land, and effectively repressing any young forest growth. The State, however, has recognized the need for action, and has recently placed a small export duty on timber, the proceeds of which are to be devoted to the reafforestation of Government lands. In Sweden, therefore, as in Russia, the future will see some improvement in the methods of forest exploitation, but with a crop like trees results mature but slowly, and especially in a high latitude.

I do not propose to do more than merely allude to the position of matters in the United States and Canada. The Bureau of Forestry of the United States has recently issued several publications that take a distinctly gloomy view of the situation. In one of them[1] it is stated that in that country "the present annual consumption of wood in all forms is from three to four times as great as the annual increment." In another official brochure[2] it is estimated that the timber supply will be exhausted in thirty-five years at the most, but that this point may be reached as soon as nine years. In its publication entitled "The Waning Hardwood Supply," the Bureau commits itself to an estimate of sixteen years as the duration of the supply of this class of timber.[1] That the United States is feeling the pinch of scarcity is clearly indicated by the fact that she is importing more and more timber every year.

I will not presume to say more about the position of the timber supply in the country in which we are now assembled than this, that it is common knowledge that great areas of forest in the Eastern Provinces have been depleted, that the exports of Canada's most valuable lumber tree—White Pine—have greatly diminished, and that she has now got to import no inconsiderable quantities of such hardwoods as hickory, oak and walnut. But that there are great untapped areas to the north of Ontario and Quebec and on the west of the Rocky Mountains appears to be generally admitted, and no doubt the meeting will be favored with an authoritative statement on this important subject.

There is one region of the world to which the eyes of men are keenly bent, that seems to offer possibilities of considerable, perhaps of large, supplies, but it is most difficult to make even an approximate estimate of what these possibilities really are. I refer, of course, to Siberia. The latest authoritative statement of the timber resources of that country has come in the form of a report from the British vice-consul, Mr. Hodgson,[2] who speaks hopefully of developments in the East of Siberia, where forests cover an incalculable area. From that region timber may be got out to the Pacific by means of such great rivers as the Amur; but with regard to Siberia as a whole, the opportunities of export are very limited. A shipping trade with the north of that country cannot be contemplated, and transportation over thousands of miles of rail is almost equally impossible.

I have indicated the opinion of M. Mélard with regard to the future of Russia's timber exports, I may also quote his opinion on the question of the world's supply generally. In the review already referred to he says: "The con-

1 The Timber Supply of the United States, 1907. p. 12.

2 The Drain upon the Forests, 1907, p. 15.

1 p. 8.

2 Report on the Lumber Industry in the Russian Far East, 1908.

sumption of wood is superior to the normal production of all accessible forests, and there is a deficit in this production that is temporarily compensated for by the destruction of forests." In other words, we are living on our forest capital, and everyone knows where such a spendthrift proceeding must ultimately land either the community or the individual.

The increasing difficulty in obtaining supplies of timber is clearly reflected in the rise of price on the English market. The most important class of imported wood is classed in the Board of Trade returns as "Sawn or split, planed or dressed," and whereas, according to Sauerbeck's figures, the average price for the ten years, 1888-1897, was 44s. 6d. per load, it was 57s. in 1907, a rise, namely, of 28 per cent. Striking as is this rise, it only represents a half truth, for we have to bear in mind two facts, the one, that during that time certain of the more valuable classes of timber were getting scarcer on the market (e.g. the White Pine of Canada and the Eastern United States, and the Kauri Pine of New Zealand); and the other, that the quality of imported timber generally has been steadily and rapidly falling for some years. Several witnesses examined by the Royal Commission on Coast Erosion and Afforestation stated that timber now passed as Grade II would have been put into Grade IV or V twenty or thirty years ago.[1] If, in fact, we could compare exactly the same quality of timber to-day with that of fifteen years ago, we should find that the rise in price in the interval was much more than 28 per cent. The United States Department of Agriculture has made such a comparison for the years 1886 to 1908 in a tabular sheet recently issued,[1] which shows that of thirty-two brands of timber nine had risen 100 per cent. and over, fourteen from 50 to 100 per cent., seven from 25 to 50 per cent. and only two less than 25 per cent.

There are, of course, those who maintain that all fears of a timber famine are groundless, and that when the proper time comes, some way will be found for getting the huge supplies that exist in Siberia to the world's markets. They also point to the use of iron and concrete as substitutes for wood, and of the stalks of sugar cane as a substitute for pulp wood. But in spite of the fact that other substances are now being used to replace wood for certain purposes, statistics show that the consumption of timber is annually increasing, and that the maintenance of the supply is one of the most important economic problems that confront mankind. It is extremely difficult to say how much can be done in this direction, but at least it is obvious that a great effort should be made to save timber from wasteful destruction by forest fires. It is also clearly in the interests of every country to see that forests are exploited in such a way as to secure immediate regeneration of the denuded areas. And, lastly, it is becoming more and more recognized that silviculture offers a means for the profitable utilization of much waste land, and of land that is at present yielding a rent of only a few pence per acre for rough grazing. These and many other aspects of the timber problem cannot be amplified in the present paper, though perhaps other members of the association may find time to deal with them.

1 Report p. 9, Vol. II and the evidence of Parry, Henzell, Walker, Forbes, Margerison, Mackenzie and Somerville.

1 Wholesale Lumber Prices, 1886-1908.

The Tree Planting Problem in Western Saskatchewan and Southern Alberta.

By A. Mitchell, Tree Planting Division Forestry Branch.

Most people coming into the Western Provinces for the first time are struck forcibly with two important aspects peculiar to the prairies, namely, their immense area and their treelessness.

All the way up from Winnipeg to a point a few miles east of Regina native poplar growth may be seen on either hand from the train; but from that point to the foothills of the Rockies, a

distance of about 500 miles, the lack of tree growth never fails to be remarked. It is a great stretch to be practically without trees and its breadth is in proportion, for it extends from the boundary line at least two hundred miles north, and in all this vast area practically the only indigenous trees are a few scattered specimens dotted along the river bottoms, with the exception of the forest on the Cypress Hills (a strip of about forty miles long by ten or fifteen broad). The rest of this immense area is practically treeless, except where some enterprizing farmer has made a beginning towards doing his share of furnishing a much-needed complement to the prairie landscape.

Causes Contributing to Treelessness.

The causes contributing to this treelessness have been much discussed. Undoubtedly the cheif cause has been fire; even before the coming of the white man the prairie was often fired by the Indians, usually either to circumvent an enemy or to provide grass for the buffalo during the following season. The very richness of the prairie soil, which caused such a luxuriant growth of grass that the young trees were eventually smothered, and the comparatively low rainfall of southern Alberta and southern Saskatchewan, preventing the germination of seeds, also contributed largely to this result.

The Chinooks.

The chinook winds of Southern Alberta and the western portions of South Saskatchewan were also powerful factors in checking the natural spread of tree growth, but their most important effects were exerted indirectly rather than in the way many of the old timers thought. The chinooks are warm winds which come over the mountains from British Columbia, and in summer, after a day or two's vigorous "chinooking", the grass gets crisp and brown and the water holes dry up very rapidly. In winter the chinook makes the snow disappear as if by magic, and it looks as if a slice of early spring or fall had suddenly been sandwiched into the heart of winter. Both these conditions are peculiarly favorable to the progress of a prairie fire, and thus is brought about the significant fact that in the district mentioned it was possible for a prairie fire to sweep over the entire country any time of the year except about two months in the very vigor of the growing season. Very small indeed were the chances of any tree seedlings surviving many seasons under conditions like these.

At one time it was thought that the warmth of the chinooks encouraged the flow of sap in winter and that a sudden frost immediately following killed the trees, but this is a theory that has not much to support it. There may have been cases where this has occurred, but it has not been general and probably confined only to introduced trees. If this thawing and freezing have had any large share in bringing about the treelessness of the prairie, why do we find such fine specimens of poplar in the valleys of the Old Man, the Bow and other rivers of Alberta? and why do we find usually a fringe of pine trees, commonly Lodgepole Pine or Western White Pine, along the crests of the hills north of Pincher Creek? These trees stand right in the teeth of the chinooks, and if there were much in this theory of thawing and freezing surely that is where it would be most felt. But no! there they stand, some of the poplars 50 or 60 feet high, and doubtless close to 100 years old, proof positive that on them at least the chinooks have had no evil effects. The surrounding country is bare because of repeatedly recurring fires from which these trees were protected by the snow drifts along the edge of the river valleys. A visit to the fringes of pines will soon convince the observer that they also were saved by their surroundings, for they are growing either in rocky land where there was no grass to carry over the fires, or among ground cedar (or, rather, dwarf juniper) which would not burn, and so kept the fires at a distance.

The Settlers.

The first settlers were cattle ranchers and such a country suited them well. There was abundance of grass and water, and although some of them may have wished for a little more tree shelter for their stock very few took the trouble to find out if trees would grow or not. Those who did usually found their attempts ended in failure and till within a few years ago the general opinion was that

trees would not grow on the prairies and that, as was actually said once at a meeting at Medicine Hat, "Providence never intended trees to grow on the prairie, or they would be there now."

The Experimental Farms.

In dispelling illusions such as these the work of the experimental farms soon began to make itself felt—largely through their publications, for, living as they did many miles from the farms, very few of the Western men ever had an opportunity to actually see the farms for themselves. People gradually got the idea that it was possible to grow a few trees, especially in sheltered situations, and the free distribution of small quantities of seedlings gave a great stimulus to the movement. But these experiments were mostly confined to the towns, and very few farmers had done any planting prior to 1900 and that nearly always in the river bottoms or behind the shelter of a slab fence. Here and there you would find a farmer who had dug holes in the sod and planted a tree or two, but these were, of course, always a dismal failure.

The Forestry Branch.

The co-operative system of tree planting was begun by the Forestry Branch of the Department of the Interior in 1900, and utilized to a very great extent the results of the work of the Experimental Farms. A very complete system of procedure has been worked out which has given good satisfaction, and the success of the efforts of the officials and the popularity of the work is attested by the fact that the number of applicants this year is 44 per cent. greater than last year.

The inspection of the land prior to planting was of great importance, as proper preparation had been found of paramount necessity in all the work of the experimental farms; its usefulness will be readily allowed when it is known that only about 50 per cent. of the people who apply for trees have their land ready for planting when visited by the inspectors. And when it is remembered that thirteen million trees have already been distributed it will be seen how important this feature of the work has been, for, if these trees had been sent out indiscriminately to all and sundry who applied for them, there would have been at least six millions and a half which never would have had a chance to grow. Value these at 25 cents per 100 and you have a saving effected to the country of $16,250.00 in seedling trees alone, not taking into account their potential value to the future. Add to this the labor saved by these men in insisting on close planting, early cultivation and wide plantations kept well back from the buildings and so on, and you have work done of a value many times beyond its cost.

With regard to supplying trees, when it is remembered that two and a quarter millions were sent out this spring, and that the number of applicants is increasing so rapidly, it will be readily seen that all the private nurseries in the West together would find it difficult to keep up with the demand.

Now-a-days people have a far better understanding of the question and even in southern Alberta, in the chinook country, people realize that trees will grow on the prairie, if you treat them properly.

Preservation of Soil Moisture.

But while tree growing is proving quite successful it must never be forgotten that the conditions which worked so strongly against the natural forest are still with us and are just as much the enemy of tree life as ever they were. Other conditions are different now, though, for settlement has curtailed the prairie fire, and plantations seldom or never suffer from that source, and thanks to the work of Mr. MacKay we know now how to carry over the rainfall of one year to help that of the next, and by cultivating thoroughly the year before planting—either by summer fallowing or by breaking and backsetting—we are able to give the young trees a first-rate start and a good chance of success. Careful cultivation for three or four years afterwards, till the branches meet and shade the ground, brings the plantation through till it is able to take care of itself. Broad belts of twenty or thirty yards wide with the trees closely planted, not wider than four feet, we find of great advantage in combatting the lack of rainfall. A narrow belt of only four or five rows allows the drying winds to go through it, and in a prolonged dry spell with high winds the plantation is sure to suffer.

This rainfall question is one that few of the settlers understand at first and many are astonished when they are strongly advised not to prune their trees up like whip stocks or plant them at six or eight feet apart as they used to do where they came from.

The Chinooks and the New Plantations.

In the new plantations in the chinook belt we have found no trouble so far from the untimely flow of sap in the winter and the subsequent freezing that we used to hear so much about. What does do damage occasionally is the lack of moisture in the winter, for it must be borne in mind that in that country there is no steady covering of snow to protect the trees and keep the ground moist as there is farther east. This sometimes gives trouble, but we find that if cultivation has been thorough the previous summer and so a plentiful supply of moisture has been kept in the soil there is usually no damage done.

Photo by A. Knechtel

Inspector of Reserves Knechtel and Chief Forest Ranger Margach (Calgary), on a tour of inspection along the eastern slope of the Rockies. (August, 1909.)

Damage from Early Frosts.

In the more elevated parts of Alberta, towards the foothills and northwards, a good deal of trouble has been experienced with early frosts. It is not so much the earliness of the frost, as the fact that in these districts the rainfall is usually much greater than further out on the prairie, and the growth is sometimes carried on late into the fall, when, if the new shoots are not matured when frost comes, the trees are sure to be killed back to within a few feet of the ground. This is notably the case with the Dakota Cottonwood and sometimes also with the maple, and it has now been decided to plant a hardy variety of Russian Poplar in the plantations instead of cottonwood. Whenever there is likely to be trouble of this sort it has been found good practice to pinch back the tips of the growing shoots about two weeks before frost is expected, which stops length growth and enables the wood to ripen up before the first nip of winter. On this account, also, it is well in these districts to stop cultivating earlier in the season than usual and it should never be done after the middle of July. Any weeds that may grow up after that date and are likely to seed may be destroyed by hand pulling.

Irrigation.

Under irrigation the plantations do extremely well, and, as might be expected, their growth is considerably greater than under "dry" conditions. Care, however, must be exercised to avoid

applying the water too late in the season in case the trees keep on growing late in the fall and we have trouble from frost. Water should never be applied after July 1st. Fall irrigation has latterly been found safest, and some of the best men now thoroughly soak their plantations just before the freeze-up in the fall, and cultivate in the following summer in the usual way. This insures abundance of moisture in the growing season and gives excellent results, while it has the merit of being quite safe.

The Public Schools.

One interesting feature of the tree planting movement is the attitude which some of the school districts are beginning to take towards it. Several of these have already taken advantage of the assistance afforded by the Forestry Branch with very good results, and it is to be hoped that there will be quite an extension of this kind of planting in the future. This is work that is well worth encouraging and shows a proper appreciation on the part of the trustees of the fact that the school is the social centre of the district in which it is situated, and if the tastes of the children are to be influenced by their surroundings, no better way of directing these tastes could well be devised than by surrounding the school grounds with trees. For best results, however, it would be well for them to remember that at least two acres of ground are necessary, though three would be better. We have seen how important it is to establish wide belts in the drier parts of the country; and one acre, which is the usual area secured for school grounds, is far too small. The larger area is necessary to allow for the plantation being set back a suitable distance from the buildings to avoid trouble from snowdrift, and when allowance is made for a sufficient width of plantation, there is not much room for playground or demonstration plots. Not very many school districts have taken this matter up so far, but what has been done is only another indication of the place that tree planting is beginning to take throughout the land. School inspectors and the Departments of Education have been encouraging tree planting a great deal and it is to be hoped that in a very few years the school that has not a belt of trees sheltering its grounds will be a very rare exception.

Thus on all hands, from public institutions and individual farmers, tree planting on the prairies is receiving more and more attention as time goes on. Already a good deal has been done and plantations are beginning to show up against the level line of the prairie horizon and making a pleasant variety in the monotony of the landscape, but the region requiring to be planted is very long and very wide and there still remains an immense amount of work to be done before every farm is furnished with the number of trees it ought to have.

The Forest Trees of Canada.

The list of trees given below includes only those native to Canada; hence it will be noticed that a number of familiar trees, such as the Norway Spruce and English hawthorn, are not included.

The scientific names have as far as possible been brought into accordance with the rules adopted by the International Botanical Congress, held at Vienna in 1905. For the eastern trees the names given in the seventh edition of Gray's Manual of Botany have been adopted, and for the western species Piper's "Flora of Washington" has been the general guide. The popular names given agree very largely with those adopted in the "Checklist of the Forest Trees of the United States," by Mr. G. B. Sudworth (U. S. F. S. Bulletin No. 17).

As to the distinction between trees and shrubs Dr. C. S. Sargent's "Silva of North America" (Boston, 1890-1902) has been followed. In this connection may be quoted Dr. Sargent's definition of "trees" as "all woody plants which grow up from the ground with a single stem, excluding all such as habitually branch at the ground into a number of stems, whatever size or height they attain" (see preface, Vol. I, page viii).

The chief works consulted in the preparation of this list have been Dr. Sargent's "Silva," Prof. Macoun's "Catalogue of Canadian Plants," Gray's "Manual of Botany" (seventh edition), and Piper's "Flora of Washington," referred to above; Prof. Macoun's paper on "The Forests of Canada" in the Transactions of the Royal Society of Canada, Vol. XII (1894), pt. iv; Dr. Sargent's "Manual of the Trees of North America," Mr. Sudworth's "Checklist of the Forest Trees of the United States," and Mr. J. R. Anderson's "Lists of the Trees of British Columbia," published in the Canadian Forestry Journal and the proceedings of the Canadian Forestry Convention (Ottawa, 1906).

For assistance received from Prof. Macoun and Mr. J. M. Macoun in compiling this list the editor wishes to express his thanks.

Common Name.	Botanical Name.	Distribution.
1. Alder, Red	Alnus oregona Nutt	B.C.
2. Alder, White (Mountain)	Alnus tenuifolia Nutt	B.C.
3. Arbor Vitae	Thuja occidentalis Linn	P.E.I., N.S., N.B., Que., Ont., Man.
4. Arbor Vitae, Giant	Thuja plicata Don	B.C.
5. Arbutus (Madrona)	Arbutus Menziesii Pursh	B.C.
6. Ash, Black	Fraxinus nigra Marsh	P.E.I., N.S., N.B., Que., Ont.
7. Ash, Blue	Fraxinus quadrangulata Michx	Ont.
8. Ash, Green	Fraxinus pennsylvanica Marsh., var. lanceolata (Bork.) Sarg	Que., Ont., Man., Sask.
9. Ash, Red (Rim)	Fraxinus pennsylvanica Marsh	N.S., N.B., Que., Ont., Man.
10. Ash, Oregon	Fraxinus oregona Nutt	B.C.
11. Ash, White	Fraxinus americana L	P.E.I., N.S., N.B., Que., Ont.
12. Aspen	Populus tremuloides Michx	All Canada east of the Rocky Mts.
13. Aspen, Large-toothed	Populus grandidentata Michx.	N.S., N.B., Que., Ont.
14. Balm of Gilead	Populus balsamifera L	All the provinces.
Balsam Poplar; see Balm of Gilead		
Balsam Fir; see Fir, Balsam		
15. Basswood	Tilia americana Linn	N.B., Que., Ont., Man.
16. Beech, American	Fagus grandifolia Ehrh	P.E.I., N.S., N.B., Que., Ont.
17. Beech, Blue	Carpinus caroliniana Walt	Que., Ont.
18. Birch, Sweet (Cherry or Black)	Betula lenta Linn	N.S., N.B., Que., Ont.
19. Birch, Paper (Canoe, White)	Betula alba Linn., var. papyrifera (Marsh.) Spach	All the provinces.
20. Birch, Western	Betula occidentalis Hooker	B.C., Alta.
21. Birch, White	Betula populifolia Marsh	P.E.I., N.S., N.B., Que.

Common Name.	Botanical Name.	Distribution.
22. Birch, Yellow	Betula lutea Michx	P.E.I., N.S., N.B., Que., Ont.
23. Buckthorn, Cascara	Rhamnus Purshiana deC	B.C.
24. Butternut	Juglans cinerea Linn	N.B., Que., Ont.
Buttonwood; see Sycamore		
25. Cedar, Red	Juniperus virginiana L	N.S., N.B., Que., Ont., B.C.
Cedar, White; see Arbor Vitae		
Cedar, Western White; see Arbor Vitae, Giant		
26. Cherry, Bitter	Prunus emarginata Walp	B.C.
27. Cherry, Black	Prunus serotina Ehrh	P.E.I., N.S., N.B., Que., Ont.
28. Cherry, Choke	Prunus virginiana Linn	N.B., Que., Ont.
29. Cherry, Western Choke	Prunus demissa Walp	B.C.
30. Cherry, Wild Red (Bird)	Prunus pennsylvanica Linn	N.S., N.B., Que., Ont., Man., Sask., Alta., B.C.
31. Cherry, Woollyleaf	Prunus emarginata villosa Sud	B.C.
32. Chestnut	Castanea dentata (Marsh.) Borkh	Ont.
Cornel; see Dogwood		
33. Coffeetree, Kentucky	Gymnocladus dioica (L.) Koch	Ont.
34. Cottonwood	Populus deltoides Marsh	Que., Ont., Man., Sask., Alta.
35. Cottonwood, Black	Populus trichocarpa Torr. & Gray	B.C.
36. Cottonwood, Lanceleaf	Populus acuminata Ryd	Alta.
37. Cottonwood, Narrowleaf (Black)	Populus angustifolia James	Alta.
38. Crab-apple, Sweet (American)	Pyrus coronaria Linn	Ont.
39. Crab-apple, Oregon	Pyrus diversifolia Bong	B.C.
Cratægus, see Haw		
40. Cucumber Tree	Magnolia acuminata Linn	Ont.
41. Cypress, Yellow	Chamaecyparis nootkatensis Spach	B.C.
42. Dogwood, Alternate-leaved (Blue Dogwood)	Cornus alternifolia Linn. f	N.B., N.S., Que., Ont.
43. Dogwood, Flowering	Cornus florida Linn	Ont.
44. Dogwood, Western Flowering	Cornus Nuttallii Aud	B.C.
45. Elder	Sambucus callicarpa Greene	B.C.
46. Elm, Cork (Rock)	Ulmus racemosa Thomas	Que., Ont.
47. Elm, Slippery (Red)	Ulmus fulva Michx	Que., Ont.
48. Elm, White (American)	Ulmus americana Linn	P.E.I., N.S., N.B., Que., Ont., Man., Sask.
49. Fir, Alpine	Abies lasiocarpa (Hook.) Nutt	Alta., B.C.

Common Name.	Botanical Name.	Distribution.
50. Fir, Balsam	Abies balsamea (L.) Miller	P.E.I., N.S., N.B., Que., Ont., Man
51. Fir, Douglas	Pseudotsuga mucronata Sud.	Alta., B.C.
52. Fir, Lowland (Western Balsam Fir, Western White Fir)	Abies grandis Lind	B.C.
53. Fir, Amabilis (White)	Abies amabilis (Dougl.) Forbes	B.C.
Fir, Yellow; see Fir, Douglas		
54. Gum, Black (Sour)	Nyssa silvatica Marsh	Ont.
55. Hackberry	Celtis occidentalis Linn	Que., Ont., Man.
56. Haw, Scarlet	Crataegus coccinea Linn	N.S., Que., Ont., Man.
57. Haw, Pear	Crataegus tomentosa Linn	N.S., N.B., Que., Ont.
58. Cockspur Thorn	Crataegus crus-galli L.	Ont.
59.	Crataegus brevispina (Dougl.) Heller	B.C.
60.	Crataegus columbiana Howell	B.C.
61. Hemlock (Eastern)	Tsuga canadensis (L.) Carr.	P.E.I., N.S., N.B., Que., Ont.
62. Hemlock, Western	Tsuga heterophylla Sarg	B.C.
63. Hemlock, Black	Tsuga Mertensiana Carr.	B.C.
64. Hickory, Shagbark (Shellbark)	Carya ovata (Mill.) K. Koch	Que., Ont.
65. Hickory, Pignut	Carya glabra (Mill.) Spach	Ont.
66. Hickory, Mockernut (Whiteheart)	Carya alba (L.) K. Koch	Ont.
67. Hickory, Bitternut	Carya cordiformis (Wang.) K. Koch	Que., Ont.
68. Hickory, Little Pignut	Carya microcarpa Nutt	Ont.
Hornbeam, see Beech, Blue		
69. Hornbeam, Hop	Ostrya virginiana (Mill.) Koch	N.S., N.B., Que., Ont.
Ironwood; see Hornbeam		
Juneberry; see Serviceberry		
70. Larch, American	Larix laricina (DuRoi) Koch	All the provinces.
71. Larch, Western	Larix occidentalis Nutt	B.C.
72. Larch, Mountain	Larix Lyallii Parl	Alta., B.C.
73. Locust, Honey	Gleditsia triacanthos L.	Ont.
74. Maple, Black	Acer saccharum, var. nigrum (Michx f.) Britton	Que., Ont.
75. Maple, Dwarf	Acer Douglasii Hook	B.C.
76. Maple, Oregon (Broad-leaved)	Acer macrophyllum Pursh	B.C.
77. Maple, Sugar (Hard)	Acer saccharum Marsh	P.E.I., N.S., N.B., Que. Ont.,
78. Maple, Manitoba	Acer Negundo Linn	Ont., Man., Sask., Alta.
79. Maple, Mountain	Acer spicatum Lam	P.E.I., N.S., N.B., Que., Ont., Man.

Common Name.	Botanical Name.	Distribution.
80. Maple, Red (Soft)	Acer rubrum Linn	P.E.I., N.S., N.B., Que., Ont.
81. Maple, Silver	Acer saccharinum Linn	N.B., Que., Ont.
82. Maple, Striped	Acer pennsylvanicum Linn	P.E.I., N.S., N.B., Que., Ont.
83. Maple, Vine	Acer circinatum Pursh	B.C.
Moosewood; see Maple, Striped		
84. Mountain Ash	Pyrus americana (Marsh.) deC	N.S., N.B., Que., Ont., Man.
85. Mountain Ash, Western	Pyrus sitchensis (Roem.) Piper	B.C.
Mountain Balsam; see Fir, Alpine		
86. Mulberry, Red	Morus rubra Linn	Ont.
87. Oak, Bur	Quercus macrocarpa Michx	N.B., N.S., Que., Ont., Man.
88. Oak, Chestnut	Quercus prinus Linn	Ont.
89. Oak, Dwarf Chinquapin (Dwarf or Scrub White or Overcup)	Quercus prinoides Willd	Ont.
Oak, Mossycup; see Oak, Bur		
90. Oak, Pacific Post	Quercus Garryana Douglas	B.C.
91. Oak, Pin	Quercus palustris Muench	Ont.
92. Oak, Post	Quercus stellata Wang	Ont.
93. Oak, Red	Quercus rubra Linn	P.E.I., N.S., N.B., Que., Ont.
94. Oak, Scarlet	Quercus coccinea Muench	Ont.
Oak, Scrub; see Oak, Bur		
95. Oak, Swamp White	Quercus bicolor Willd	Ont.
96. Oak, White	Quercus alba Linn	Que., Ont.
Oak, Western White; see Oak, Pacific Post		
97. Oak, Yellow	Quercus velutina Lam	Ont.
98. Papaw	Asimina triloba Dunal	Ont.
Pepperidge; see Gum, Black		
99. Pine, Bull	Pinus ponderosa Dougl	B.C.
100. Pine, Jack	Pinus Banksiana Lam	P.E.I., N.S., N.B., Que., Ont., Man. Sask., Alta.
101. Pine, Lodgepole (Black)	Pinus Murrayana Murray	Alta., B.C., Y.T.
Pine, Oregon; see Fir Douglas		
102. Pine, Limber (Rocky Mountain Pine)	Pinus flexilis James	B.C., Alta.
103. Pine, Pitch	Pinus rigida Mill	N.B., Que., Ont.
104. Pine, Red	Pinus resinosa Aiton	P.E.I., N.S., N.B., Que., Ont., Man.
105. Pine, Scrub	Pinus contorta Dougl	B.C.
106. Pine, Silver	Pinus monticola Dougl	B.C.,
107. Pine, White	Pinus strobus Linn	P.E.I., N.S., N.B., Que., Ont., Man.
Pine, Western White; see Pine, Silver		

Common Name.	Botanical Name.	Distribution.
108. Pine, Whitebarked	Pinus albicaulis Engel	Alta., B.C.
109. Plum, Canada	Prunus nigra Ait	N.B., Que., Ont., Man.
Poplar; see also Cottonwood, Balm of Gilead, Aspen		
110. Poplar, Vancouver	Populus vancouverensis Trelease	B.C.
111. Red-bud	Cercis canadensis L	Ont.
112. Sassafras	Sassafras variifolium (Salisb.) Kotze	Ont.
113. Service-berry	Amelanchier canadensis (L.) Medic	N.B., N.S., Que., Ont.
114. Sheepberry	Viburnum lentago Linn	Que., Ont., Man., Sask., Alta.
Shadbush; see Service-berry		
115. Spruce, Alberta	Picea albertina Baker	Alta.
116. Spruce, Black	Picea mariana (Mill.) B.S.P.	All provinces.
117. Spruce, Engelmann	Picea Engelmanni Engel	Alta., B.C.
118. Spruce, Red	Picea rubra (DuRoi) Dietr	P.E.I., N.S., N.B., Que.
119. Spruce, Sitka (Menzies)	Picea sitchensis Carr	B.C. (coast).
120. Spruce, White	Picea canadensis (Mill.) B.S.P.	All provinces.
Sugarberry; see Hackberry		
121. Sumach, Dwarf	Rhus copallina Linn	Ont. (1000 Isles.)
122. Sumach, Staghorn	Rhus typhina Linn	P.E.I., N.S., N.B., Que., Ont.
123. Sycamore	Platanus occidentalis Linn	Ont.
Tamarac; see Larch		
Thorn, Scarlet-fruited; see Haw, Scarlet		
Thorn, Black (Pear); see Haw, Pear		
124. Tulip-tree	Liriodendron tulipifera Linn	Ont.
Viburnum, Sweet; see Sheepberry		
125. Walnut, Black	Juglans nigra Linn	Ont. (southern).
Whitewood; see Tuliptree		
126. Witch Hazel	Hamamelis virginiana Linn	N.S., N.B., Que., Ont.
127. Willow, Almondleaf (Almond or Peach W.)	Salix amygdaloides Anders	Que., Ont., Man., Sask.
128. Willow, Bebb (Livid)	Salix rostrata Rich	All Canada.
129. Willow, Black	Salix nigra Marsh	N.S., N.B., Que., Ont., Sask.
130. Willow, Glaucous	Salix discolor Muehl	N.S., to Man.
131.	Salix discolor, var .eriocephala (Michx.) Anders	N.B., Que., Ont.
132. Willow, Glossyleaf (Shining)	Salix lucida Muhl	All provinces but B.C.

Common Name.	Botanical Name.	Distribution.
133. Willow, Hooker.....	Salix Hookeriana Barratt....	Vancouver Island; near the Grand Rapids of the Saskatchewan.
134. Willow, Longleaf (Sandbar).....	Salix longifolia Muhl.....	Que., Ont., Man., Sask., Alta., Northern B. C., Mackenzie Dist.
135. Willow, Mackenzie.....	Salix cordata Muhl var. Mackenzieana Hook.....	Great Slave Lake and Mackenzie River, south through the region at the base of the Rockies.
136. Willow, Nuttall.....	Salix Nuttalii Sarg.....	Alta (Cypress Hills), B. C. (Donald).
137. Willow, Silky.....	Salix sitchensis Sanson.....	B.C.
138. Willow, Silverleaf.....	Salix sessilifolia Nutt	B.C.
139. Willow, Western Black..	Salix lasiandra Benth.....	B.C.
140.	Salix macrostachya.....	
141. Yew, Pacific.....	Taxus brevifolia Nutt.....	B.C.

The Canadian Conservation Commission.

The appointment of the Conservation Commission marks another important step forward in the policy of making the best use of Canada's natural resources. The Commission has been constituted under the act of last session specially providing for its creation, of which an outline was given in the last issue of the Journal. The personnel of the Commission was announced on August 31st last.

Hon. Clifford Sifton, who, it will be remembered, was the chairman of the Canadian delegation at the International Conservation Commission in February last and subsequently chairman of the special committee of the House of Commons on Forests and Waterpowers, has been appointed chairman of the Commission. The other members are: Hon. Sydney Fisher, Hon. Frank Oliver and Hon. Wm. Templeman, Dominion Ministers of Agriculture, of the Interior and of Mines, respectively; Hon. F. L. Haszard, Premier of Prince Edward Island; Hon. W. T. Pipes, Commissioner of Crown Lands of Nova Scotia; Hon. W. C. H. Grimmer, Surveyor-General of New Brunswick; Hon. Jules Allard, Minister of Lands and Forests of Quebec; Hon. Frank Cochrane, Minister of Lands, Forests and Mines for Ontario; Hon. Hugh Armstrong, Provincial Treasurer of Manitoba, Winnipeg, Man.; Hon. J. A. Calder, Provincial Treasurer of Saskatchewan; Hon. A. C. Rutherford, Premier and Provincial Treasurer of Alberta; Hon. F. J. Fulton, Commissioner of Lands and Works of British Columbia; Hon. Benjamin Rogers, of Alberton, P.E.I.; Prof. Howard Murray, of Dalhousie University, Halifax, N.S.; Messrs. Frank Davison, of Bridgewater, N.S.; Cecil C. Jones, M.A., Ph.D., Chancellor of the University of New Brunswick; W. B. Snowball, of Chatham N.B.; Dr. Henri S. Beland, M.P., of Beauce, P.Q.; F. D. Monk, M.P., Montreal, P.Q.; Dr. W. J. Robertson, President of Macdonald College, Ste. Anne de Bellevue, P.Q.; Mgr. J. C. K.

Laflamme, Dean of the Faculty of Arts, of Laval University, Quebec; Sir Sandford Fleming, Ottawa; Hon. W. C. Edwards, Ottawa; E. B. Osler, M.P., of Toronto; C. A. McCool, ex-M.P., of Nipissing, Ont.; J. F. Mackay, of 'The Globe,' Toronto; Dr. B. E. Fernow, Dean of the Faculty of Forestry of the University of Toronto; Rev. Dr. Geo Bryce, of the University of Manitoba, Winnipeg; Dr. W. J. Rutherford, of Regina, Deputy Commissioner of Agriculture for Saskatchewan and Dean of the Agricultural College; Prof. H. M. Tory, of Strathcona, President of the University of Alberta, and Mr. John Hendry, of Vancouver, B.C.

Members of the Canadian Forestry Association will note with interest that the Commission includes the Vice President of the Association, four of the Provincial Vice-Presidents and four Directors. The Journal congratulates these gentlemen on their selection as members of the Commission, as the result of whose investigations great things are hoped for, not only for the forests of Canada, but also for the other natural resources of the Dominion.

Reserves for Protection of Game.

By T. N. Willing, Chief Game Guardian for Saskatchewan.

In the prairie provinces, the home of the grouse and breeding ground of the wild fowl, the decrease in numbers is alarmingly evident. Big game is fast disappearing, there being now not one living buffalo in Saskatchewan, and only about two thousand antelope scattered over the south western portion of the province, with probably a like number in Alberta, while both these species are now extinct in Manitoba.

Settlers are coming into the country in great numbers and the area under cultivation has increased over one hundred per cent. the last season. This is a small proportion of the land area of the province, but it has a widespread effect on the game preservation problem, as on the outskirts of settlement the temptation to kill for the pot usually proves stronger than any respect for the game laws. If, then, it is thought desirable to maintain wild game in the country, some steps must be taken to provide suitable areas where various species may breed unmolested by man.

Some unthinking persons fail to see any reason, practical or sentimental, why any effort should be made to perpetuate the existence of the wild creatures, but fortunately this is not the view held by the majority, and the movement for more effective protection is actively supported by both the sportsmen and the nature lovers—two classes that do not, however, entirely agree as to what should be considered game.

In my opinion those wild creatures that necessitate healthful exercise and skill in the taking and are of value as food when taken should be considered game, and the best measures possible taken to favor their propagation to offset the loss incident to the hunting season. Both migratory and non-migratory game may be considered a valuable asset to the country if we look at the matter from a utilitarian point of view. The food value of the game annually consumed by our people, especially in northern districts, would be hard to estimate, but might be represented by very high figures, and there is a distinct advantage in having a good supply of birds feeding over our fields, picking up vast quantities of insects and seeds that may be detrimental to our crops.

A close season in Spring for all birds is a very important step in the right direction, as no game can increase, or even exist for long, if hunted and harried at the time of mating and nesting. The birds may nest in the immediate neighbourhood of our homes, in the absence of guns and dogs, but every shot fired in Spring gives fresh impetus to the flight of the migrants towards the northern wilds, or possibly destroys a prospective parent of a downy brood. A majority of the Canadian provinces and most of the Northern States have already prohibited spring shooting, and it is hoped others will soon fall in line. The

advocates of federal legislation for protection of birds during migration have good arguments to advance and the subject is worth consideration.

Our land owners have the right under Section 7 of the Saskatchewan Game Ordinance to prohibit shooting upon their enclosed or cultivated lands, and they might with advantage exercise their right and themselves protect the game upon their farms from destruction by vermin or vagabond.

Reserves. Native birds and other game should, because of hardiness and suitability to the climate, prove more profitable to raise than tender introduced forms, and a wide market could be found for game after it had served the purpose of furnishing the sportsmen with the pleasure of the chase. The dual purpose wild game may yet prove very profitable by the combination of sporting and market value, and game be available for the tables of the people for years to

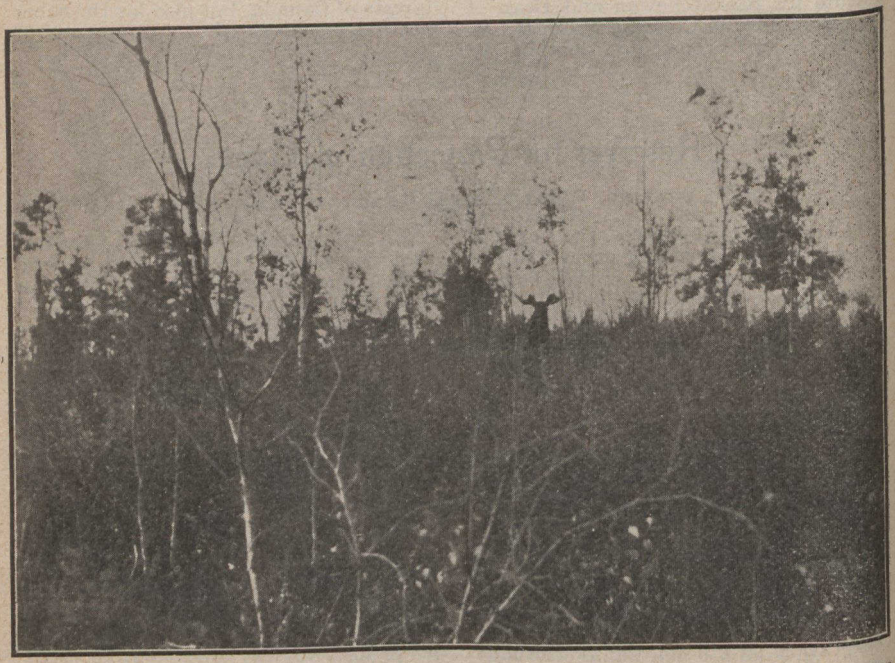


Photo by H. R. MacMillan

The above cut of a moose, made from a photograph taken on the Riding Mountain Forest Reserve, gives some idea of the possibilities of that reserve as a game preserve.

Lands unsuitable for cultivation in settled communities might with advantage be reserved and stocked with birds from the larger reserves after some planting of trees and shrubs had been done. Wild lands might well be leased to clubs or syndicates that would put a game keeper or keepers on the land to protect and propagate game. The escapes from such game preserves would help stock the surrounding country.

I see no reason why experiments in the propagation of game should not be conducted by the Government on Forest

come. Deer farming has been the subject of one bulletin issued by the Washington Government which is well worth reading.

Aside, however, from anything in the way of experimental work the Forest Reserves might be made serve the very good purposes of refuges and breeding grounds for game by the prohibition of the carrying of guns upon the reserves and by having the wolves and other checks to the increase of game destroyed by the forest rangers. The prevention of fires will prove a great help towards

increasing the number of birds, and, when the numbers justify it, birds for restocking might be transferred to districts where this would be an advantage.

It may not be out of place here to point out the great destruction of game wrought by the coyote. During 1908 bounty was paid in Saskatchewan on 141 gray wolves and over 15,000 coyotes. If we assume that a coyote destroys on an average one bird a day for a year, we would see that the killing of those coyotes had saved the lives of over 5,000,000 birds, or enough to have provided each man, woman and child in Saskatchewan at the end of 1908 with 14 birds.

Gray and timber wolves have proved very destructive to big game in the northern portion of our province and in the country beyond, and also have been troublesome on the ranges in the Cypress Hills district, where all those were killed that bounty was paid on.

We must eliminate competition in the killing of game and preserve it for our sportsmen by cutting out the wolf, weasel, etc. We might then find that, after prairie and forest fires have been kept out for a time, the increase of game would permit the maintenance of liberal game laws that would encourage our young men to indulge more in healthful and invigorating exercise in the open, where they could enjoy the beauties of nature and become more familiar with bird life. Reserves and game refuges should in years to come furnish a constant overflow of game that would radiate from these centres through the surrounding country.

The number and area of forest reserves might well be increased in this province and some lands set aside as public parks and pleasure resorts. It would seem that Saskatchewan had been overlooked in this matter when we look westward and observe the large Dominion Reservation and Museum at Banff stocked with game and exhibits; nearer Edmonton we see a large elk park enclosed and stocked, while on the plains nearing the border of our province we find the large new buffalo park has been located. I do not think it can be said that no suitable lands can be found in Saskatchewan, the former home of the buffalo, the antelope and other large game.

The problem of how best to prevent the antelope and the beaver from soon becoming extinct is one for consideration and may well be thought over by our legislators, both Federal and Provincial. Bearing on this is the fact that, owing to the prolonged close season for beaver now in force, complaints are received from settlers on prairie streams of the damage the beavers are doing to their much prized timber along the banks, one man pathetically stating that where he had a nice grove previous to the coming of the beaver he has now only a hundred and eighty stumps. If an open season for beaver is proclaimed, it is certain that many newly established colonies will be depopulated; so some other scheme for retaining breeding stock must be devised. It may be that trapping privileges might be granted to the person on whose land a colony occurs, conditional on the protection and maintenance of the colony. On forest reserves trapping of the fur bearing animals should be regularly carried on under supervision of the forest ranger.

There are areas of suitable land about some of our prairie lakes that could be reserved for the antelope and the water fowl. A movement is on foot for the establishing of bird reservations, and much progress has been made along this line by our neighbours to the south. There are many islands in our inland lakes on which the gulls, cormorants, pelicans and other interesting birds nest in vast numbers, and these also should be reserved as permanent refuges and breeding grounds for these birds.

More attention to care of game on Indian reserves should be given by the Indian Department and endeavors made to have the Indians realize the advantage of conforming to the requirements of the game law as to close seasons.

British Columbia Forestry Commission.

The Forestry Commission appointed by the Government of the Province of British Columbia to enquire into the timber resources of the province, forest preservation and protection, afforestation and kindred subjects held its first

session at Victoria, B.C., on August 16th. The Commission consists of Hon. F. J. Fulton, Commissioner of Lands for that province and Messrs. A. S. Goodeve, M.P., of Rossland, and A. C. Flumerfelt, of Victoria. Mr. R. E. Gosnell was appointed secretary. The Commission held sessions at the following places: Victoria, Nanaimo, Vancouver, New Westminster, Kamloops, Vernon, Revelstoke, Nelson, Cranbrook, Fernie and Grand Forks. The commissioners also attended the First National Conservation Congress at Seattle, Wash., on August 26th, 27th and 28th. Among the questions on which evidence has been taken are the advisability of extending the term of licenses, the exporting of second and third class cedar, export and import duties, the extension of the system of fire wardens, the destruction of debris and the protection of the forests from fire generally. The importance of the last named item was especially emphasized. An interesting incident of the sittings was the application of the Municipalities of Vernon and Spallumcheen for the setting aside of lands on the Aberdeen Mountain watershed for the purposes of a forest and game reserve, which was very favorably received. The report of the Commission is awaited with much interest.

A Travers les Revues Forestiers Francaises.

JOURNAL FORESTIER SUISSE PUBLIE A BERNE.

Janvier 1909.

Influence du gel sur la chûte des feuilles. M. Paul Jaccard continuant les recherches de Wiesner à ce sujet étudie la signification biologique de la chute des feuilles. Habituellement les arbres feuillus se dépouillent brusquement de leurs feuilles dès les premiers froids, tandis que l'an dernier, la plupart des arbres ont conservé une partie de leur feuillage assez longtemps. L'altération dûe au froid produisit un effet divers suivant les essences, changement de couleur chez les fruitiers, les feuilles des chênes et du marronnier devinrent cassantes et se recroquevillèrent, etc. Mr. Jaccard explique ces phénomenes par l'absence de la couche séparatrice du côté du pétiole, alors que normalement cette couche séparatrice se forme dès le ralentissement de la végétation. Aux premiers froids il se forme entre les cellulles aqueuses et turgescentes de la couche de séparation, une lamelle de glace qui fait détacher les feuilles de l'arbre. Comme les arbres étaient encore en activité et les feuilles n'étant pas préparées à dis paraître le gel a bien altéré les cellules du limbe mais la chlorophylle n'a pas été désorganisée et n'a subi qu'une décomposition partielle.

Nouveau plan d'études de la Section forestière de l'Ecole polytechnique fédérale.

L'ancien plan d'études comprenait six semestres, mais la Conférence des professeurs de la Section forestière a élaboré un projet augmentant d'un semestre la durée des cours afin de donner une culture plus complète aux jeunes forestiers. On élimine quelques cours théoriques pour les remplacer par des leçons pratiques.

Mars 1909.

Ce numéro renferme des détails très intéressants au sujet des travaux de défenses construits pour protéger contre les avalanches la ligne du Gotthard.

BULLETIN DE LA SOCIETE CENTRALE FORESTIERE DE BELGIQUE.

Cette société qui compte plus 1,000 membres publie un intéressant bulletin, aujourd'hui dans sa 16eme année sociale, édition menseulle.

RÉGÉNÉRATION DE L'EPICÉA.

Dans le Janvier numéro et les deux suivants M. le garde général Pokin énumère les conditions et traitement de régénération de l'épicéa tant en Suisse qu'en Allemagne (Forêt Noire) et discute leurs applications aux forêts belges.

EXPÉRIENCES ET OBSERVATIONS EN MATIÈRE FORESTIÈRE.

Le service de recherches forestières belge publie à tous les deux ans un résumé des recherches faites sur l'élevage des plants en pépinière. Les notes publiées cette année porte sur l'influence de l'origine des graines de pin sylvestre, établissant la supériorité de la semence indigène, puis sur le repiquage et la résistance des végétaux au froid et à l'insolation. (Nous résumerons ces notes dans un article spécial sur les Pépinières).