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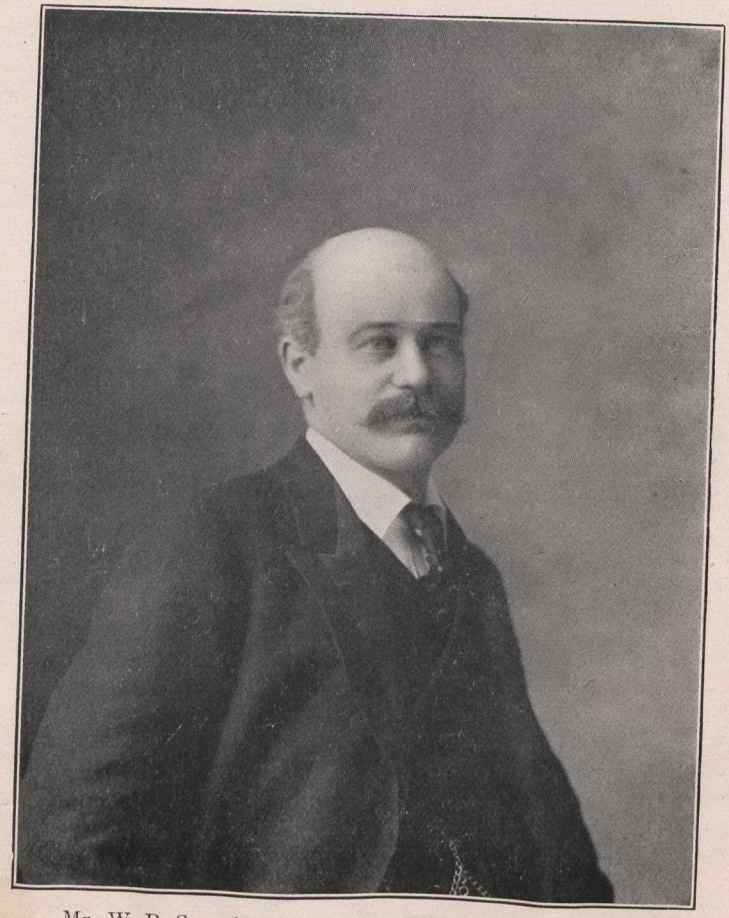

Mr. W. B. Snowball, Pres. Can. For. Assn., 1908-1909.

Canadian Forestry Journal.

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THE TORONTO 1909 CONVENTION.

A special meeting of the Canadian Forestry Association was held in Toronto on Thursday and Friday, February 11th and 12th. The President of the Association, Mr. W. B. Snowball, occupied the chair at all the meetings, which were held in the Convocation Hall of the University of Toronto.

The outstanding features of the meeting were the report of progress made by the representatives of the Province of New Brunswick, (Hon. W. C. H. Grimmer, Surveyor-General, and Mr. R. B. Miller, Professor of Forestry in the Provincial University), and the speeches of Hon. Frank Cochrane, Minister of Mines and Lands for the Province of Ontario, who invited criticism of the forest administration such as would show points where the administration might be improved, and, at the banquet given by the Board of Trade on Friday evening, announced the Government's plans for the regaining by the Crown of much of the territory now under license. Mr. Aubrey White's paper on the "Forest Resources of Ontario" was also a valuable feature of the programme.

THE OPENING SESSION.

The first session opened at ten o'clock on Thursday morning, February 11th. His Excellency Earl Grey, Governor-General of Canada, occupied a seat on the stage to the right of the President, and with him on the stage were His Honor J. M. Gibson, Lieut.-Governor of Ontario, and Hon. Sidney Fisher, Dominion Minister of Agriculture.

His Excellency opened the meeting. In his address he referred to the intimate bearing which the scientific management of the forests had on the industrial and agricultural interests of the nation, and generally on its health and happiness. The President of the United States had called the attention of that nation to the fact of a timber famine being imminent, owing to their reckless exploitation of their forests, and had called together a conference to consider the question of the conservation, not only of their forests, but also of their other natural resources. The published reports of this conference had done much to convince the people of the republic that there was a direct relation between the forests and the flow of the streams on which

both agriculture and navigation depended, and they were standing nearly a unit for forest protection. His Excellency spoke of the President's message lately published, where the awful consequences of deforestation in China were described and illustrated, and suggested the publication of these pictures, especially for use in the schools. "The teaching of the people how to care for their forests is becoming the first object of the American Government," concluded His Excellency. "I hope it will also become the first object of the Canadian people. The forest area in the Dominion is 354,000,000 acres. By far the greater part of this is still Crown land, or in other words, belongs to the people. The question for you to determine appears to me to be this: Shall this great inheritance, of which you are the trustees, be handed over to uncontrolled individuals to be misused, without regard to the interests of posterity, or shall it be managed under careful and well considered regulations on lines which will increase the public revenues, at the same time that they will ensure a steady advance in capital value?"

His Honor Lieut.-Governor Gibson followed briefly, welcoming the Association, especially the visitors from the other provinces. He recalled the fact that it was under his regime that the forest reserve policy of the Province of Ontario had been inaugurated and the Eastern and Sibley Forest Reserves set aside. A start had also been made toward setting aside the Temagami Reserve.

President Watson, of the Toronto Board of Trade, then welcomed the Association on behalf of the Board of Trade, of whose sympathy and co-operation he assured them for their meeting.

Hon. Sidney Fisher then was called upon. He referred to the necessity of the conservation of forests as the basis of all other resources. While Canada had not been so wasteful of her resources as the United States had, it still had followed that country's example to a large extent. Canadians had been in the habit of trading too much on their supposed forest wealth; but their estimate of their timberland—three hundred and fifty million acres—was too large. It must be remembered that a large proportion of this land was far to the north and the timber thereon was of far less value, of lower quality and at present almost inaccessible; it was not to be compared with the valuable pine limits of Ontario and Quebec. Hon. Mr. Fisher went on to show the importance of the preservation of the forests to the navigation of the Great Lakes and the St. Lawrence River. He concluded with a reference to the International Conservation Conference which was to take place in Washington in the following week.

New Brunswick's Position.

Hon. W. C. H. Grimmer, Surveyor-General of New Brunswick, was the next speaker, and in the course of his address made a pretty thorough review of forestry matters in his province. In regard to present conditions he noted that 10,000 square miles of the province were now under timber license, while 1,000,000 acres of Crown lands were not yet applied for. The province's annual cut was about 150,000,000 superficial feet, and the upset price of timber limits per mile was $20; the stumpage dues varied from 40 cents per thousand feet for hemlock to $1.25 per thousand feet for spruce, pine and cedar. The Crown lands had greatly increased in value during the past few years, land that in 1893 and 1898 was worth $8 per mile being now worth $200 to $500 per mile. After a dull year in 1908 the lumber business was reviving. He briefly reviewed the changes in the regulations made during the year, and noted the improved fire protection system which had met with marked success. He spoke in favor of natural reforestation and raised the question of the reforestation of heathland and bogs. He also referred to the foundation of the chair of forestry in the University of New Brunswick and spoke favorably of the scheme of a topographical survey of the province and classification of the public lands.

Delegates from Other Organizations.

Mr. Frank Hawkins, speaking on behalf of the Canadian Lumbermen's Association, expressed the good wishes of that organization to the Canadian Forestry Association. Apropos of the connection between the forests and the streams, he noted that this year Lake Temiscaming was 19 feet below its level at any previous time, while at the same time the St. Lawrence was higher than ever before—striking proof of the effect of denudation on the water flow.

Prof. W. T. McClement, of Queen's University, expressed the sympathy of that institution with all movements to promote the conservation of the forests and other natural resources of the country.

Mr. Achille Bergevin, of Montreal, spoke as the representative of the Province of Quebec Association for the Protection of Fish and Game. He noted the close connection between the preservation of the forest and that of the fish and game. In addition to recent laws much remained to be done in Quebec in the direction of better classification of lands, regulation of cutting, more careful collection of dues and prevention of fire. No fire should be allowed for clearing land and no more timberlands should be sold. The speaker favored the appointment of a Royal Commission to investigate the whole question of the export of pulpwood. Other suggestions made by him were the appoint-

ment of a non-political commission to supervise forest lands, increases in the technical staff and in the number of forest and fire wardens and greater attention to popular education in forestry.

Mr. J. Kelly Evans, on behalf of the Forest, Fish and Game Protective Association of Ontario, urged continued and more extended propaganda work through the press and by the medium of public lectures and talks, illustrated where possible. The apathy of the people he regarded as the worst enemy of the cause.

Mr. John B. Laidlaw, speaking for the Fire Underwriters' Association, told of the waste of wood and other structural material through fire; the loss of property in Canada and the United States through fire was ten times what it was in European countries. He mentioned some of the great forest fires in Canada, advocated the burning of slash and referred to the necessity of preserving the forests in order to protect the streams.

The Canadian Society of Forest Engineers was represented by its President, Dr. Fernow. He referred to the advance of forestry knowledge, and especially the increase in the number of technically trained men. The Society he represented now numbered about twenty men, almost all trained foresters, and he had had part in educating nearly fifty per cent. of these. He emphasized the fact that forestry was a patriotic subject and that the forester, cut off as he was from society much of his time, must be a man of high morals.

The session was then adjourned.

Thursday Afternoon.

At Thursday afternoon's session the first item was the reading by the President of his address. After returning thanks for his election to the office of president and welcoming those present in the name of the Canadian Forestry Association, he referred to the establishment of the Faculty of Forestry in the University of Toronto and the chair of forestry at the University of New Brunswick. He advocated also the sending out by the Governments of lecturers throughout the country to give popular talks on such subjects as "fire fighting and precautions against fire, economical methods of cutting and logging, the building of roads, bridges and dams, the value of forest cover in regulating stream flow, the advantage of trees to the farm, methods of raising trees from seed and planting them at the least cost, how to combat the diseases of trees, with some practical instruction in forest mensuration methods, how thinnings should be made, etc." He was also in favor of each province having a proper survey made of its wooded area, and suggested that the

University professors and students should be employed for the purpose in their vacations, having associated with them surveyors, practical lumbermen and land cruisers. More stringent laws regarding the setting of forest fires were needed, and there should be permanent fire guardians, whose beat should not exceed one hundred square miles. Forest reserves should be maintained at the headwaters of all the principal streams. After referring to the export of Christmas trees, he took up at some length the question of the export of pulpwood. "The Americans want our pulpwood to save their own. We want their mills, not only to increase our industrial employment, but so that they will have a large investment depending on our forests and thus give them an interest with us in conserving our forests." He quoted at length from the statements made by the International Paper Company to the Ways and Means Committee of the Congress of the United States in the tariff investigations and also from Dun's Bulletin, with the object of bringing before the minds of his hearers the value of the Canadian forest product and also to show that the people of the United States wanted Canadian wood in order to save their own. He concluded by urging his hearers to take a practical interest in forestry questions.

Dr. A. T. Drummond.

A paper by Dr. A. T. Drummond was then read by Mr. R. H. Campbell. Mr. Drummond treated a number of the practical questions confronting Canada, in respect to her forests, at the present time, and concluded by summarizing his points as follows:—

The Governments of Ontario and Quebec should each establish a Bureau of Forestry.

Trained foresters should be permanently employed in the supervision of the forests with a view to the protection, the methodical cutting and the continuity of these forests.

Holders of licenses should be compelled to cut their timber on some approved forestry plan, to leave standing a certain number of pine and spruce trees on every square mile for the purpose of natural seeding, and should be required to plant annually and protect several pine and spruce seedlings for every tree of these species which they cut down.

Holders of timber licenses should be required, before the close of each winter, to effectually dispose of all debris arising from the cutting down and trimming of their trees.

Railway companies and mill owners operating within the forest areas should, during the summer and autumn months, be under strict obligation to protect, by night as well as by day, from fire, a defined area or strip on each side of the railway or mill, with a large penalty for failure to do so.

A penalty of two years' imprisonment, without option of a fine, should be imposed on all campers, hunters, settlers and others who, during the summer months, neglect to effectually guard their camp clearing and other fires during the time they are burning, and to put them completely out when they are done with them.

President Falconer.

President Falconer, of the University of Toronto, was then introduced and briefly welcomed those present in the name of the University of Toronto. The University had a Faculty of Forestry which had trebled during the year and which lent strength to the University. The people must be trained to look upon their country not merely as a possession for a generation, but as something which future generations had to share and on the better informed portion of the community rested a large measure of responsibility for impressing this on the public mind.

Ontario's Forest Resources.

Mr. Aubrey White, Deputy Minister of Lands and Forests for Ontario, then described at length "The Forest Resources of Ontario." Mr. White outlined the position of affairs in regard to the provincial timberlands at Confederation, and traced the subsequent history of the public lands through the sales of 1871, 1872 and on through 1887, 1894 and up to 1904. Since Confederation 12,000 square miles had been sold, and a total of fifty and a quarter million dollars realized from these; of this nine and a quarter millions were from lands and mines, the rest from bonus, ground rent and stumpage dues. The average annual cut for the last ten years had been 673,000,000 feet, and for the last two years 710,000,000 feet. There were still standing, on licensed lands, seven billion feet of white and red pine, besides hemlock, spruce and jack pine. Speaking with respect to the unlicensed lands, Mr. White took these up by districts; district No. 1 comprising that part of the province east of Port Arthur and south of the Height of Land; district No. 2 comprising the country east of Port Arthur and north of the Height of Land, and district No. 3 took in all the country west of Port Arthur to the boundary. This whole territory gave a total of thirteen and a half billion feet. The total amount of Ontario's standing timber was thus twenty and a half billion feet, and the estimate of the pulpwood was two hundred and fifty million cords. The present timber resources were estimated to be worth $370,000,000. For the protection of the forests from fire there had been spent last year $140,000. Next year a great

danger would arise from the building of the Transcontinental railway, some six hundred miles of which would be under construction.

Mr. Southworth thought it would be a mistake to include the pulpwood growing on agricultural land as a provincial resource; that would become the property of the settlers. Mr. White thought that even in this case the money would mean wealth to the settler and so to the province.

Dr. Fernow pointed out that, even if the present supply of timber would last for thirty years, after that time there would be people who would have to have timber. While Mr. White's estimate of twenty and a half billion feet sounded large, it would last the United States for only half a year.

Conditions in the Maritime Provinces.

Mr. F. C. Whitman, President of the Western Nova Scotia Lumbermen's Association, then read a paper on "Forest Conditions in Nova Scotia." In a few words he summed up the conditions of forestry and lumbering in Nova Scotia as follows: "The cutting of timber and the output of lumber have reached the limit of reasonable production, and the increasing value of lumber has a tendency to draw altogether too heavily upon our diminishing timber reserves. The axe has struck into trees that a few years ago were considered either inaccessible or unmerchantable. In former years lumbering depended almost entirely upon the rivers and streams, but the building of new railways and steam logging roads have widened the field of operations and added the menace of fire, which is too well known to require comment." He laid particular stress upon the difficulties presented by the tenure of land in Nova Scotia at present. The Crown land acreage amounted to 1,500,000 acres, holdings by large lumber concerns to 1,900,000 acres and there were 2,500,000 acres held in lots of 500 acres or less. "The difficulty of administering these lands," he said, "will be appreciated when it is remembered that in a single square mile there is often a bit of Crown land, a timber lot and a settler's holding." "We have in Nova Scotia," he remarked again, "a fire fighting force, organized on preventive principles, that is both effective and efficient." The scheme of fire protection had been evolved, in the face of much discouragement, by the leading lumber firms of western Nova Scotia. In this connection he paid a tribute to the law-abiding character of the people, who recognized others' property rights and were willing to do their part for the public welfare. The Government was now projecting a plan for a descriptive survey of the provincial forest lands. The most difficult matters to be dealt with were those involving conflicts of private interest with the public interest.

"General Forestry Conditions and Forestry Education in New Brunswick," was the title of a paper by Mr. R. B. Miller, M.A., M.F., Professor of Forestry in the University of New Brunswick. The first part of the paper was composed of a description of the province as to geology, topography, climate and precipitation with a consideration of the effect of these on growth. The interrelation of the forest types with the soil and other physical factors was also described. "The forest is, on the whole, with the exception of white pine and larch, composed of tolerant, rapidly growing species, with great reproductive power," the paper stated, and the different forest types were described, such as the northern hardwoods, the spruce flats, slopes and swamps, even-aged stands of fir or arbor-vitæ and the growth on barren lands. Prof. Miller then went on to sketch the course in forestry under his direction, explaining the necessity for the forester's study of each subject. He explained also the necessity for practical work; part of this would be given on a tract of six square miles of forest land adjacent to the University and belonging to it. The study of sawmill work would be made in the sawmills of Fredericton, while for the "woods end" of the work the students would be sent to the lumber camps. A summer school might also be established for short courses.

Friday Morning.

On Friday morning the first paper presented was that by Dr. B. E. Fernow on "What we Want." The wants of forestry advocates were briefly summed up by Dr. Fernow as follows: "It is, then, simply these three things in one that we want: a management of the public forest property for continuity, which involves protection against destruction of the young growth and cut-over lands from fire; segregation of agricultural lands before cutting begins; and a change of methods of disposal which will give control to the Government over the manner of cutting and of leaving the timber limits." Dr. Fernow briefly referred to what had already been done in the direction of meeting these demands. He noted the steps taken by the Dominion Government and that of the Province of Quebec. The present method of appointing fire rangers came in for severe treatment. "It is not likely that a large army of incompetent, inexperienced men, recruited afresh every year and appointed through political influence, even if a sprinkling of competent woodsmen is added, will successfully cope with the evil. Thorough organization of smaller groups of continuously employed, experienced men, which may be assisted by some less experienced during the dangerous season, and thorough continuous inspection while they are at work is necessary.

This nucleus of permanent foresters should be directed by active superiors in charge of this special service and in sympathy with the broader policies which are to follow the effective fire protection." The paper then treated the area of timberland of the Dominion of Canada and the present stand of timber, and noted the uncertainty of the estimates in both of these cases and the absolute need of a descriptive forest survey of the timberlands. The reasons for the slow progress of the propaganda on behalf of conservative forest management were stated, the last and most potent, in the author's judgment, being "the momentum of existing methods of disposal of the timber which benefit an influential class of citizens, namely, the timber limit holders, who will naturally battle for their continuance, and the natural unwillingness of governments to make radical changes." The paper concluded with the suggestion of the appointment of permanent provincial legislative committees composed of influential members of the Association to study local conditions, formulate and secure a hearing for propositions to the Government and push them to realization, employ all local means for educating and arousing the public and altogether be in charge of the work of the Association between meetings."

Dr. Fernow's paper gave rise to a discussion of some length. The most important contribution was made by Hon. Frank Cochrane, who said that the Association ought to criticize; he welcomed criticism and would try to improve the administration of the forests accordingly. He gave credit to his predecessors for starting the fire protective service, which was being improved. Provincial patrol was better than, or at least as good as, private patrol. He noted also the forward step the province was taking in waste land planting.

Others who took part in the discussion were Prof. McClement, of Queen's University, who urged the importance of popular instruction by means of addresses, illustrations, etc.; Mr. R. H. Campbell, who spoke of the interest in forestry that was being aroused by the Association, especially by the publication of the FORESTRY JOURNAL and of newspaper bulletins and occasional lectures; Mr. J. M. Macoun, who discussed the JOURNAL and its policy; Mr. Geo. Y. Chown, who suggested the appointment of a paid secretary; Mr. E. Stewart, who emphasized the educational aim of the Association, and Rev. Dr. A. E. Burke who spoke as the representative of Prince Edward Island

The last item on the morning's programme was the paper by Mr. A. Knechtel, Inspector of Dominion Forest Reserves, which is published in full elsewhere in this issue.

Friday Afternoon.

At the opening of Friday afternoon's session Mr. J. B. Miller, Vice-President of the Ontario Lumbermen's Association, was called on, and spoke briefly, favoring the appointment of a Royal Commission for the investigation of forestry questions. He congratulated Mr. White on his presentation of Ontario's case, and expressed gratification at the figures presented.

Prof. W. Mulford was then introduced and heartily received. He represented, he said, three bodies, namely, the Michigan Forestry Association, the Michigan University Foresters' Club and the Michigan Forestry Commission. He considered that the most pressing problems before governments and foresters to-day were those of protection, taxation and devising of satisfactory cutting methods. The problem of protection was pressing. The problem of taxation was to devise some scheme of taxation which should be equitable to all parties represented, particularly to the private owner. In the U. S. National Forests ten per cent. of the gross receipts from timber sales were handed over to the counties in which the National Forests were located. The reason for this was that the counties should not suffer from having these reserves made; otherwise, the reserving of these lands would impose a burden on the counties which would lose the taxes on the lands reserved and so throw additional burdens on the remaining lands. The problem in regard to the cutting methods was to devise methods of cutting which should result in natural reproduction and avoid the necessity of the expensive operation of planting.

Hon. W. C. Edwards was then introduced and spoke briefly. After references to some of the papers and discussions, he went on to speak particularly of the Rivers and Harbors Conference and the Conservation Congress in Washington in December last, which he had attended as the representative of the Canadian Government, and read the letter which he had addressed to Sir Wilfrid Laurier as his report on these. He spoke strongly of the necessity of exploration and the estimating of timber on lands about which no definite information was on record. The problems of reforestation and of location of settlers on timber limits were calling for solution. He believed that the forests could be so managed that they would reproduce satisfactorily and be all the better for cutting.

Ontario's Waste Land.

The first paper presented at the session was that by Mr. E. J. Zavitz on "Waste Land Planting in Ontario." Mr. Zavitz estimated the aggregate area of woodlots in Ontario at 8,500

[Photo by E. J. Zavitz

" Pine plains " in Simcoe county. There are about 50,000 acres of this type of land in this county. It is covered chiefly with Red Pine and scattering White Pine.

square miles, while waste land (sand, gravel and rock formations and steep hillsides) would total another 8,000 square miles, so that it was safe to estimate eight million acres as the amount of private land in older Ontario which should be managed for forest crops. Estimating the annual increment at half a cord per acre, this, at a stumpage value of $2.00 per thousand board feet, would mean an annual resource of $8,000,000. In its work of assisting private woodland owners in planting, the Ontario Department of Agriculture had distributed 400,000 trees in 1908. The Department of Agriculture were also making a start at the work of reclaiming the waste areas of the province by tree planting. Of sandy land, unfit for agriculture, Norfolk County had 10,000 acres, Lambton 40,000 acres, Bruce 30,000 acres, Simcoe 60,000 acres and Northumberland and Durham 15,000 acres. Large portions of these were not entirely cleared, but were covered with a scrub growth. Frequent fires killed out the young White Pine, which, if protected, would soon cover much of these waste areas. In calculating the cost of planting such lands, estimates were made as follows: rate of interest, 3½ per cent; cost of land, $2 to $5 per acre; cost of plant material, $5 per acre; cost of labor for planting, $5 per acre; cost of management and protection, 15c. per acre per year; rate of taxes, 17 mills on the dollar per year. An acre of White Pine, at the end of sixty years, would thus cost $165.34; this amount was made up as follows: Cost land ($5) at 3½ per cent. for sixty years, $39.39; cost of plants and planting ($10) at 3½ per cent. for sixty years, $78.78; management and protection, 15c. per year, at 3½ per cent. for sixty years, $29.48; taxes, 9c. per year, at 3½ per cent. for sixty years, $17.69. Assuming (on the basis of various studies made in the Lake States and elsewhere) that at the end of sixty years there would be left on the acre two hundred trees of an average diameter of eighteen inches (each of which trees would yield at least 300 ft. b.m.) we get a yield of 60,000 board feet, which, at $10.00 per M stumpage would be worth $600.00. The net profit was thus $439.66, equivalent to an annual rental of $2.25 during the sixty years. Mr. Zavitz concluded his paper with a short review of the work in replanting carried on in Prussia, France, Japan, the United States, the states of New York and Wisconsin and by the Pennsylvania Railway.

The Paper Manufacturer and the Forest.

Mr. Carl Riordon, General Manager of the Riordon Paper Mills, followed with a paper entitled "The Attitude of the Paper Manufacturer towards Conservative Forestry Methods." In summing up his paper Mr. Riordon said:

"I think, then, that the pulp and paper industry has most at stake in the forest and is likely to adopt conservative methods in the use of it in so far as cost and profit will

permit, and that they will do this even more than our Governments because the people are indifferent about conservation. Our pulp and paper industry is now carefully studying forestry and has already applied more conservative methods, and a good many firms will soon have adopted thorough going systems and will be applying them as far as the regulations will permit and where they are sure of retaining their timber. The Canadian Pulp and Paper Manufacturers think that the exportation of pulp wood fosters a careless use of the forests and that Canada has not enough pulp wood to afford this and that the Government should find out what we have and adopt a well-founded policy rather than let matters drift, as at present."

Speaking at greater length in regard to the management by the paper companies of their woodlands, he said: In Canada there has been almost a revolution in the last few years among the pulp and paper firms operating timber limits, in the direction of conservation. We are all taking a much greater quantity of timber per tree; taking the tops down to four inches diameter under the bark, and taking dry trees, dosy butts, and bark-rotted logs. We are limiting our cuts to annual growth where possible. We have evolved fire patrol systems that have prevented serious fires in our timber. The Laurentide Paper Co., the Union Bag & Paper Co., and the Riordon Paper Mills, are all employing trained foresters and spending considerable money in thoroughly investigating their timber resources and everything to do with their development, and in studying timber growth and methods of manufacturing logs. They are inaugurating the policy of marking the trees that shall be cut, and are adopting rules for jobbers and foremen that are eliminating the waste of anything they can possibly use. This means making use of a great deal more of the product of the forest than any other industry does.

Mr. Riordon thought that present Government regulations in Quebec rather discouraged the putting in operation of thorough systems of forest management. He complained especially of timber thieving under pretence of settlement, also of the restrictions as to diameter limit. In regard to the former he stated that, out of 7,000,000 acres granted to settlers in recent years in Quebec, 2,000,000 acres were already stripped and abandoned.

Conditions in Quebec.

The last paper of the afternoon was given by Mr. Ellwood Wilson, Forester of the Laurentide Paper Co., of Grand Mere, P.Q., and was entitled "Lumbering in Northern Quebec." North of the St. Lawrence, Mr. Wilson said, the province was essentially forest land. Natural reproduction was good on cut

and burned-over areas; but, owing to the present rule of cutting to a diameter limit, balsam reproduction was crowding out the spruce. Sixteen per cent. of the land was brule, burnt for the most part from twelve to thirty years ago, the fires being started largely by river-drivers. The present Government system of selling timber had two main defects. First, the Government has a right at any time to open up lands under license for settlement without in any way compensating the licensee for the loss of his timber (a proceeding which often amounted to confiscation). Secondly, there was no guarantee that a change in administration might not result in an increase in ground rent and stumpage dues that would take away entirely the margin of profit.

Mr. Wilson described the method of cutting timber, by letting the work to a "jobber," who let it out again to "sub-jobbers," and pointed out its defects. Only the timber easiest to get at was taken under this system, and the timber left will be harder to get at and harder to cut when it comes to be taken. Much timber was left in the woods, and burnt-over territory was seldom cut. A number of improvements were suggested. Ground rents should be fixed for a term of years, with at least two years' notice of any intended change. A definite colonization policy should be pursued. The licensee should be given a year's notice to remove his timber from lands to be taken up. Lots should be taken up in a definite order. The settlement conditions should be enforced, with cancellation as the penalty for non-compliance. Settlers should be required to prove that they were bona fide settlers, not mere speculators, should not be allowed to burn up the timber in clearing the land and should be required to leave one quarter of their land in permanent woodlots. The fire protection laws should be made easier to enforce and should be rigidly enforced and the rangers should be given authority of arrest without reporting to the Government. The laws should be so amended that a conviction could be obtained by proving that a fire started from a camp fire or settler's clearing, set by him or his employees, without its being necessary to actually see the man light it. A force of competent and reliable rangers should be established to enforce the Government stumpage and waste regulations.

Some spirited discussion followed Mr. Wilson's paper, after which the convention closed.

The Resolutions.

In the course of the afternoon the Committee on Resolutions presented its report, which was adopted.

The following are the resolutions adopted:—

Resolved,—That this Association desires to place on record its deep appreciation of the intense interest which His Excellency Earl Grey, Governor General of Canada, has always

taken in its work. We recall with pleasure and gratification the keen interest which he took in the deliberations of the Convention held in Ottawa in 1906, his constant attendance at all its sessions, and his ready participation in the programme. This year His Excellency graciously consented to journey to Toronto for the express purpose of opening this convention, and has shown a very real interest in its proceedings. For these and many other tokens of interest in the work we have so much at heart we desire to tender His Excellency our sincere thanks.

RESOLVED,—That the thanks of this Association be extended also to His Honor, J. M. Gibson, Lieutenant-Governor of Ontario, for the honor he has conferred upon it by his presence and the active part he has taken in its deliberations.

RESOLVED,—That this Association express its pleasure and satisfaction at being again favored by the presence of the Honorable Sydney Fisher, Dominion Minister of Agriculture, who has always been a source of inspiration to us in the work we are endeavoring to accomplish.

RESOLVED,—That the thanks of this Association be tendered the Honourable W. C. H. Grimmer, Surveyor-General of New Brunswick, for attending this Convention and contributing a very able paper on the forest resources of his own province.

RESOLVED,—That this Association notes with interest that the Dominion Government proposes to appoint a Parliamentary Committee to investigate the condition of our forests. Having regard, however, to the complexity of the questions involved, the necessity of securing a correct estimate of our timber resources, the conservation of our water supply and the importance of international trade in forest products; this Association desires to urge upon the Federal Government the advisability of appointing a Royal Commission with authority to summon witnesses, take evidence in different parts of Canada, and investigate the whole subject of our forest wealth and methods of forest conservation, and to report to Parliament with a view to future joint action by the Federal and the various Provincial Governments.

RESOLVED,—That this Association desires to impress upon the Federal Government and the Governments of the several Provinces the urgent necessity of placing in permanent forest reserves all non-agricultural lands at the head waters of streams.

RESOLVED,—That the Provincial Government controlling Crown Lands be requested to permanently withdraw from location all townships under timber license, and at present open for settlement, which upon examination are found to contain less than fifty per cent. of arable land; and that no township that shall be found on inspection to contain less than fifty per cent. of agricultural land shall hereafter be opened for settlement or

location; and that in the case of townships now under license which are found to contain more than fifty per cent. of land suitable for agriculture, the licensee be given a reasonable time in which to remove the merchantable timber before the land is opened for settlement.

RESOLVED,—That this Association views with satisfaction the improvements made in the forest fire protective services of the Provinces of New Brunswick, Nova Scotia, Quebec, Ontario and British Columbia.

RESOLVED,—That a Committee be appointed by the President of this Association to consider the following methods of advancing popular forestry education: (1) The preparation and distribution of forestry bulletins suitable for use in both country and city schools; (2) The inclusion of elementary forestry instruction in the text-books on Agriculture and Nature Study now in use in the public and high schools; (3) The preparation and distribution of maps and lantern slides suitable for addresses on forestry topics to be delivered in schools and at Farmers' Institute meetings.

RESOLVED,—That a text-book on forestry should be compiled from the reports and other literature published by this Association, and distributed for use in our schools and colleges.

Moved by Mr. Achille Bergevin, seconded by the Hon. Mr. Grimmer, and RESOLVED,—That Mr. Wm. Little's eulogy of the service rendered this Association by the late Sir Henri Joly de Lotbiniere be published in the report of this Convention.

Resolutions were also passed thanking the Board of Governors of the University for the use of Convocation Hall; to the Toronto Board of Trade for their invitation to the Association to hold their convention and for the banquet; to the press throughout the Dominion for publishing the Association's bulletins and the accounts of the Convention and to the railways for granting the reduced fares.

THOSE IN ATTENDANCE.

Among those present at the various sessions of the Convention were His Excellency the Governor-General; His Honor J. M. Gibson, Lieut.-Governor of Ontario; Hon. W. C. Edwards, Ottawa; Hon. Frank Cochrane, Minister of Mines and Lands for Ontario; Hon. W. C. H. Grimmer, Surveyor-General of New Brunswick; Messrs. Wm. Little, Montreal, Que.; H. M. Price, Quebec, Que., and Aubrey White, Toronto, ex-Presidents of the Association; T. Southworth, Toronto, Vice-President; R. H. Campbell, Ottawa, Dominion Superintendent of Forestry; Dr. B. E. Fernow, Dean, Faculty of Forestry, University of Toronto; Prof. Walter Mulford, of the Department of Forestry of the University of Michigan; Rev. Dr. A. E. Burke, of Toronto;

Prof. W. T. McClement and Registrar Geo. Y. Chown, of Queen's University, Kingston, Ont.; Prof. R. B. Miller, of the Department of Forestry, University of New Brunswick, Fredericton, N.B.; Messrs. F. C. Whitman, Annapolis Royal, N.S.; Edw. G. Stairs, Halifax, N.S.; G. H. Edgecombe, St. John, N.B.; E. Hutcheson, Douglastown, N.B.; F. Schafheitlin, Montreal, Que.; A. Bergevin, Montreal, Que.; Dr. C. D. Howe and Mr. J. H. White, of the Faculty of Forestry, University of Toronto; W. G. A. Lambe, John B. Laidlaw, J. B. Miller, J. O. Thom, F. Page Wilson (Pulp and Paper Magazine), Geo. Hunter Robinson, J. E. Murphy, W. W. Firstbrook, E. S. Caswell, T. A. Gibson, Thos. Jenkins, Peter I. Bryce, F. H. Wood, R. L. Campbell, A. E. Rau, Toronto; Frank Hawkins, A. Knechtel, J. M. Macoun, A. C. Campbell, H. R. MacMillan, J. R. Dickson, F. W. H. Jacombe, Ottawa; D. McCrae, J. Hutcheon, W. T. Cockburn, Guelph; W. T. Scandrett, London, Ont.; T. H. Chapman, Baltimore, Ont.; D. James, Thornhill; W. T. C. Boyd, Bobcaygeon; Thos. Stewart, Lindsay; E. Hawthorne, Warsaw; A. L. Lovering, Coldwater; C. P. Stocking, Waubashene; Frank S. Pearce, Marmora; L. M. Ellis, West Toronto; A. McPherson, Longford Mills; W. H. Callum, Shelburne; W. B. Snowball, Chatham, N.B., President, and A. H. D. Ross, Faculty of Forestry, University of Toronto, Secretary.

The Banquet.

On Friday evening a banquet was tendered to the Governor-General and the officers of the Association by the Toronto Board of Trade at the National Club. Mr. J. P. Watson, President of the Board of Trade, occupied the chair, and those seated at the guest table were: His Excellency the Governor-General of Canada, His Honor the Lieutenant-Governor of Ontario, Sir James P. Whitney, President Falconer, Mr. Leveson-Gower, Hon. Frank Cochrane, Hon. W. C. H. Grimmer, Mr. J. B. Miller, Major James Fraser Macdonald, Mr. W. J. Gage, Mr. W. B. Snowball, Hon. J. S. Duff, Mayor Oliver, Dr. B. E. Fernow, Mr. R. H. Campbell, Mr. Thomas Southworth, Mr. A. H. D. Ross, Mr. R. S. Gourlay. Hon. A. J. Matheson, Provincial Treasurer was also present. The guests numbered nearly two hundred.

The toast list was as follows: "His Excellency the Governor-General of Canada," proposed by Mr. J. P. Watson and responded to by Earl Grey; "The Lieutenant-Governor of Ontario," proposed by Mr. W. J. Gage and responded to by His Honor J. M. Gibson; "Canada," proposed by Mr. R. S. Gourlay and replied to by Sir James P. Whitney; "The Canadian Forestry Association," introduced by Mr. John F. Ellis, Vice-President of the Ontario Forest, Fish and Game Protective Association, to which

[Photo by E. J. Zavitz

Near view of Red Pine reproduction on the pine plains. Note the dead pine in the foreground. These plains periodically burn over, killing the young growth. If this area were protected from fire it would soon reproduce with Red Pine. Fire protection, again, is a greater problem than reforesting.

replies were made by Messrs. W. B. Snowball and H. M. Price; "Toronto," proposed by Mr. J. B. Miller and replied to by Mayor Oliver.

Earl Grey, in his speech, laid special stress on the instruction of the young in the importance of the forests and their right use. Among other things he said, "What we have to do (I have been so long among you that I say 'we') is to teach the children of Canada to have patriotic regard to the conservation of the wealth of Canada."

Hon. Frank Cochrane's speech foreshadowed reforms of much importance in dealing with Ontario's forest lands. The Government, he announced, was preparing to attempt the reforestation of considerable areas of lands now under timber license, having due regard to the rights of the licensees, to whom he appealed for cordial co-operation in carrying out the scheme.

FOREST ENGINEERS' REUNION.

The members of the Canadian Society of Forest Engineers who were present at the recent special meeting of the Canadian Forestry Association in Toronto were the guests of Dr. B. E. Fernow, the President of the Society, at luncheon in the Faculty Union on Friday, February 12th. Twelve members of the Society were able to accept the hospitality of their President and Prof. Walter Mulford, who represented the University of Michigan at the Convention, was also a welcome guest. The Secretary reported that the number of active members of the Society was now eighteen, with several others in prospect, and that the financial standing of the Society was good. Prof. Mulford spoke briefly to his Canadian confreres, and gave some good hints along the line of the development of the Society. Among matters brought up for informal discussion were the publishing of professional papers and other matter and the uniting with foresters of other countries and nationalities for the discussion of professional topics, using Esperanto as the medium of communication.

DOMINION FORESTRY CONVENTION.

The estimates for the Dominion, now before Parliament, contain an item of $5,000 for the purpose of holding a Forestry Convention next fall. No details have yet been settled.

A WESTERN PROBLEM.

By R. H. Campbell

In the southern portion of the Provinces of Alberta and Saskatchewan is a large extent of prairie country, aggregating 45,000,000 acres, which has been the ranching district of the West and, owing to its generally treeless condition and moderate rainfall, the supply of wood and water are two questions of great importance. The annual precipitation in the district will average between fifteen and twenty inches, though in some years and some parts it may be more or less.

The most striking physical features of the district are the Rocky Mountains, forming the western boundary, and the Cypress Hills, which rise from the centre to a height of between three and four thousand feet above the sea. The principal rivers rising in the Rocky Mountains which flow through this territory are the Red Deer, Bow, Little Bow, Oldman, Waterton, Belly and St. Mary's, all of which unite finally to form the South Saskatchewan. The headwaters of St. Mary's River are in the United States and are the subject at present of international consideration. The Milk River, which flows for two hundred miles through Canadian territory just north of the international boundary, also has its source in the United States and finally returns there, pouring its waters into the Missouri drainage. These streams are fed from the rainfall and snowfall of the lower foothills and wooded slopes, and have their final sources in the perennial glaciers that form in the high mountain valleys above the timber line. In the mountains these streams flow through deep valleys, sometimes narrowing so as to leave little more than room for the stream, sometimes opening out so that the river wanders through the valley a narrow ribbon of lighter color among the dark green of the forest, again closed in by some bar of rock or gravel so as to hold back the waters and form the beautiful lakes of translucent green which with their varying hue form one of the most beautiful features of Rocky Mountain scenery.

As these streams flow out through the plains they groove for themselves deep channels till they are flowing two to three hundred feet below the level of the remainder of the country. It thus follows that on the upper courses of the stream, where the fall is steep, water may be taken out easily by small ditches for irrigation or other purposes while in the lower courses it is impossible to do so except by long and expensive canals of large capacity demanding large capital and engineering skill of a high order.

In the western part of the district, bordering on the foothills, which was at one time considered useless for agriculture without irrigation, winter wheat is now being grown successfully, yielding forty and more bushels to the acre. In the plains several large irrigation projects have been undertaken, such as that of the Canadian Pacific Railway Company, who are constructing works for the irrigation of a tract of three million acres from the Bow River; the Southern Alberta Company, who propose to irrigate between three and four hundred thousand acres from the same stream; and the Alberta Railway and Irrigation Company, who hold about a million acres, a considerable proportion of which they will irrigate from the St.Mary's River.

The flow of the streams is of a somewhat irregular character. The usual course is an increased flow in the spring from the melting of the snow on the lower levels, culminating with the highest flow in June when the mountain drifts and glaciers add their contribution to the runoff. From this time the flow gradually diminishes until in September and October it reaches a minimum. Sudden floods occur unexpectedly owing to heavy rains in the mountains or to a succession of hot days greatly increasing the flow from the glaciers. Such a flood occurred on the Waterton, St. Mary's and Oldman Rivers during the spring of 1908, owing to heavy rains, and immense damage was done along their course. Bridges were carried away, other property destroyed and human life was endangered. The conditions of the flow of these streams, while thus definitely stated, are not a matter of accurate knowledge and patient investigation is required before they can be stated with clearness and certainty.

The streams flowing from the Cypress Hills are of the usual character of those starting in the foothills. They are none of them large streams, and, after a short period of high water in the spring, the flow is small, and in a dry season may finally, in some streams, disappear altogether. The precipitation on these hills is greater than on the plains below, as attested by the growth of timber and hay. During the past season when the hay crop was a failure on the plains below there was a good supply on the hills that proved of the greatest assistance to many a rancher. The district watered from the Cypress Hills, though it may in years grow crops, cannot be considered as an agricultural district. The development of that district will be in the direction of establishing small grazing ranches, the stock being run on the natural grazing grounds in the summer, while, with the assistance of irrigation, feed for the winter is grown on a small area. The store of wood, hay and water from

the Cypress Hills is an absolute necessity, and such an elevation existing in the midst of a prairie country is one of its most important assets.

The growth of population in the district in question will show the increasing necessity for supplies of wood and water. At the time the census of 1901 was taken the whole population of this district was given as 32,542, while the census of 1906 showed a population of 93,330. The population of some of the principal towns is given as follows by the census of 1906:—Calgary, 11,967; High River, 1,018; Macleod, 1,144; Lethbridge, 2,313; Cardston, 1,001; Raymond, 1,568; Medicine Hat, 3,020; Maple Creek, 687; Swift Current, 554; Moose Jaw, 6,249. Most of these towns have municipal water supplies. Other and newer towns and villages are growing up and will require similar systems.

The wood reported as having been cut on the eastern slopes of the Rocky Mountains last year was 31,600,000 feet board measure, 28,037 cords of wood, 336,860 fence posts, 1,336,700 fence rails. This was all for local consumption. The increase of population will increase the demand, and, while the fuel supply may be largely provided for from the coal mines, their development will necessitate the use of large quantities of timber.

These are the general conditions of the district and they present a variety of problems for solution that are of great practical and scientific interest. The following is an outline of the investigations which are considered necessary to a thorough understanding of these conditions and a clear grasp of the principles of their administration.

1. The protection and proper management of the forests on the eastern slope of the Rocky Mountains and the Cypress Hills is a necessary part of any such policy. Since the year 1903 fire rangers have been appointed and have been patrolling the eastern slopes of the Rocky Mountains, and no destructive fires have since occurred. It is proposed to strengthen the system of rangers and possibly a chain of posts may be established along the lower timber line between which a constant patrol will be kept up during the danger season. In addition to protection a study should be made of the forest covering, its effect on precipitation and runoff, its condition, the results of its removal and the improvement of methods so as to prevent damaging consequences, and methods of reproduction and reforestation. A trained forester has been appointed and a beginning has been made towards a study of this extensive tract. During the past year a fire ranging service has been established on the Cypress Hills and a thorough inspection has been made of them with the object of establishing a forest reserve.

2. In order to obtain a thorough knowledge of the flow and general characteristics of the streams and rivers of this region a complete system of stream measurements is required. It is generally considered that it takes a series of measurements for eight or ten years to give reliable data in regard to stream conditions. A hydrographic survey in connection with the irrigation administration has been carried on for some years past, but it has not been done in a thorough and systematic way, so that the results are scattered and unrelated and give but an uncertain basis on which to decide whether water is available or not. The requirements of irrigation, the necessities of growing towns and villages, and the construction of railways and industrial development will make ever increasing demands on the water supply and accurate information in regard to it will be essential. A reorganization and enlargement of the staff to carry on such a hydrographic survey must be made, it must be equipped with the most improved and accurate instruments for gauging and measuring streams, and regular gauging stations must be established on all the principal streams and measurements taken regularly. Only by such methods systematically carried on through a series of years can accurate results be obtained.

3. The observations of the forest service, the hydrographic survey and the meteorological service should be related. Data in regard to stages of water in the streams in the plains should be supplemented by synchronous information as to precipitation and weather conditions in the mountains, the special sources of the flood discharge, and the effects of the forest cover upon the runoff. This should be obtained particularly when unusual conditions of either drought or flood occur. It could be determined then with some degree of certainty what the causes of such unusual conditions are and so much progress could be made towards the solution of the question as to whether or to what extent they can be controlled.

4. Control of stream flow by artificial structures is now receiving a great deal of consideration in America and elsewhere. The Assouan dam, a mile and a quarter in length, controlling the waters of the Nile and making productive by irrigation thousands of additional acres of the Egyptian desert, is a triumph of engineering and a tribute to the beneficence of British rule in Egypt. In Russia the navigation of the Volga is controlled to a large extent by dams at the headwaters. Reservoirs have been created at the headwaters of the Mississippi to assist in the controlling of the floods and an active discussion is now being carried on in regard to the possibility of further control of the Mississippi flow at the headwaters of the Ohio River. The United States Reclamation Service are constructing dams

of large dimensions throughout the arid west to control the stream flow. It is therefore worthy of investigation by Canada as to what are the possibilities of controlling the streams of the drier belt, which show such great and uncertain fluctuations, and in which a certain and sustained flow is a matter of the greatest importance. There are in the mountains reservoir sites which, improved by dams, might be made to control the flood waters, prevent damage in the lower valleys, conserve the flood waters for use at low water periods and improve the rivers and the supply of water for all purposes. It will take some time to investigate such a question as this and the work cannot be undertaken too early, so that when the time comes for the construction of reservoirs, whether by the Government or by private enterprise, the data necessary for a proper consideration of the question may be available.

For the dry belt in the central part of British Columbia the conditions are very similar and the necessity for investigations and observations such as proposed in Alberta and Saskatchewan is equally as patent and pressing in that section of British Columbia.

The problem of wood and water supply is one with which the future development of the portions of the West indicated is closely bound up, and the policy outlined above is submitted as one of not merely theoretical importance, though the scientific results would be great and interesting, but of the most direct practical bearing on the material development and prosperity of the West.

ANNUAL MEETING.

As provided for in the constitution of the Canadian Forestry Association, the annual meeting for the election of officers and other business will be held at Ottawa on Thursday, March 11th.

FORESTRY PERIODICALS.

In the issue of *Revue des Eaux et Forêts* for November 1st, 1908, the paper read by Mr. G. C. Piché at the 1908 annual meeting of the Canadian Forestry Association is published in full.

[Photo by E. J. Zavitz

White pine stumps on a sand dune in Norfolk County. Note the depth to which the roots penetrate. On such soil annual shallow-rooted crops have little chance as compared to the deep-rooted trees.

SOME NOTES ON FORESTRY IN ONTARIO.

The Department of Agriculture of Ontario in 1908 took a step in advance when the sum of five thousand dollars was granted for special reclamation work in Norfolk County. The Department five years ago began giving farmers assistance in waste land planting on the farm. This year the policy of acquiring non-agricultural lands where such exist in large contiguous areas has been adopted.

The first land purchased was a one hundred acre farm, south half of Lot 24, Con. 5, in Walsingham Township, Norfolk County. It is two miles from St. Williams, on the G. T. R., and is situated on the border of a sand formation some 3,000 acres in extent. In the adjoining Township of Charlotteville there is another contiguous area of about 3,000 acres. It is safe to say that in South Norfolk there exist 10,000 acres which eventually must be used for forest production. This does not include the numerous small parcels scattered throughout otherwise good agricultural soils, and which would not be included under provincial management.

The illustration on the opposite page shows one type of this Norfolk county waste land. The knoll is gradually being blown away and a few white pine stumps still stand to prove what could be originally grown in this soil. The forester must remember, however, that it was a different soil which produced these stumps. It was sand with a large admixture of humus.

The prevailing type of forest growth in this area, where cultivation has not been attempted, is composed of oaks of various species, namely, Dwarf Chinquapin, white, yellow and red (Quercus prinoides, alba, velutina and rubra) with white pine. In low situations where fires have been especially bad the poplars are prevalent. Less common species found are clack gum, (Nyssa silvatica), chestnut, butternut, black walnut, white ash, black ash, bitter and shagbark hickory.

It is interesting to note that the above farm which left the possession of the Crown in 1804 returned to the Crown in 1908 and has been settled over 100 years. It comes back much the worse for wear as may be seen in the illustration.

Probably about one-quarter of this non-agricultural belt in Walsingham township has been cleared and attempts made at cultivation. It was originally a white pine type, but cutting and continual burning has gradually changed it into a scrub oak type with scattered white pine. The scrub oak and older white pines withstand the ground fires, but the young pine seedlings are burned out at regular intervals. Last summer upon

arrival at St. Williams, I found that there was a fire fighting experience to be had. There is in this district one owner who has some good second growth white pine and he knows the value of it. The scrub oak lands above his were burning, and he was out fighting fire with some local assistance. I had an interesting conversation with one of his men as we were working along the fire line. This man informed me that it was a good thing to burn the area over often as the fire did no injury to the oak, and it would always be easy to control if too much stuff was not allowed to collect. I said that the fire was right now destroying lots of white pine and, of course, received his pity as a poor ignorant city chap. From where we stood I commenced pointing out pine seedlings from two to five years old which were being burned. He did not recognize them before, because previous to this he had imagined that a white pine was only a log and until he could see a log he could not see a white pine. It is safe to say that a large proportion of these scrub oak lands would in a few years be well stocked with white pine if fire were kept out. It is high time that the people of such districts should realize the potential value of cut-over lands where tree growth of any nature is being reproduced.

The scrub oak is a most valuable asset to these lands. It gives the soil protection and the leaves are continually adding humus to the soil. There is market for oak as fuel wood at a small profit. The larger butts of these scrub oaks are being marketed for turnery work, such as wheel hubs. A wood preservation plant will be installed and suitable fence post material will be treated. It is desired not only to make this a source of revenue from the scrub oak, but also to make it of use from an experimental standpoint.

On the better sites management will aim to leave the best quality of oak as standards, but on the high, poor sites white pine reproduction will be favored. Where natural reproduction is working in, the oak or other hardwoods will be removed as fast as marketable; the remaining material on these soils offers but little obstruction to the young pines, and is most valuable as a soil improver and protector.

Artificial planting will be carried on in open fields where there is no possibility of reproduction. In these situations experimental work with mixtures and species will be commenced. Experiments on areas covered with scrub growth will be made with seed, seedlings and transplants of white pine.

The Government Nursery at Guelph is being moved to this district and co-operative work with private land owners will be carried on from this point. The location of the nursery at the border of this waste land makes nursery management less difficult. A more permanent staff may be employed in the

nursery and utilized in various ways in protecting and managing the larger area.

Throughout the older parts of the province, there exist many similar bodies of waste lands which have been cleared for agricultural purposes or denuded by the lumberman. These areas, being sand or rock formation, will never be suited to agricultural development. The policy of the Department is to gradually segregate these lands and place them under provincial forestry management, a policy the advisability of which may be shown by many sound arguments. Such a policy will eventually release many struggling farmers who are fighting losing battles with a soil which was never intended for cultivation. Every year there are farms being abandoned in Norfolk which should never have been cleared.

A brief consideration of the figures given below will show that there is good reason for leaving the sand-farm in the hands of a loan company for mortgage or of the township for taxes. The figures have been collected from typical cases, and can be vouched for as correct.

There are two supposed sources of revenue on these lands, viz., the growing of rye and of buckwheat. On such land rye produces an average of ten bushels to the acre; this, at seventy five cents per bushel, a good price, gives a gross revenue of $7.50 for the acre. Taking the cost of a man and a team at $2.50 per day (not an excessive figure), plowing the acre, which will take the man and team about half a day, will cost $1.25. Harrowing and rolling (at the rate of ten acres per day) will cost 25 cents, and seeding (at the same rate) 25 cents more. The seed (1½ bushels to the acre) will cost $1.12. Cutting with the binder will cost another 75 cents, and threshing, at two cents per bushel, 20 cents.

The account for the acre will then stand as follows:—

Proceeds of crop		$7.50
Cost of crop—		
Ploughing	$1.25	
Harrowing and rolling	.25	
Seeding	.25	
Seed	1.12	
Cutting	.75	
Threshing	.20	
		3.82
Net proceeds		$3.68

This shows an annual revenue of $3.68 per acre, but does not take into consideration taxes, etc., which should also be charged against the crop. This argument need not be carried further to show that farming is a very poor proposition on such

soil. The economic feature is not the most serious, for along with it goes a moral or social problem which should be given attention by the state. The family placed on such lands and remaining there must in the end develop an undesirable type of citizen. It is impossible to secure the social advantages of school, church, etc., which may be had in better organized communities.

FORESTRY PERIODICALS.

The Journal of the Board of Agriculture (England) for December, 1908, contains an article on "The Large Larch Sawfly" (Nematus erichsonii), by C. Gordon Hewitt, M.Sc., F.E.S., giving the result of the author's study of the insect. The article is supplementary to the accounts of A. S. Packard and R. S. MacDougall, the latter of which was published in the same magazine for October, 1906. The male insect is described at some length; these are somewhat rare, reproduction being almost entirely by parthenogenesis. Out of 300 cocoons observed, 298 females and only two males emerged. The life history of the insect is given in detail; Mr. Hewitt found five moults (hence six larval stages) usual in the larvae he observed, instead of the three moults mentioned by Packard. A general description of the attack and its effects is given, together with a scheme of its occurrence in the Lake district (with map). Means of detecting an attack by the insect, its natural enemies (the small field vole, Microtus agrestis, is one of the most active of these), its insect parasites and remedial and preventive methods are discussed at length. Four good illustrations accompany the article.

The British Columbia Lumber, Logging and Forestry Association has recently been formed, absorbing the British Columbia Chamber of Commerce and Forestry. A. B. McRae, of the Fraser River Saw Mills, Limited, is President.

A bill has been introduced in the Maine Legislature providing for a state forest commission, consisting of a state forester at a salary of $2,500 per year, and six assistant foresters at $1,500 per year.

GAME AND FORESTRY IN CANADA.

By J. R. Dickson.

Canadians are beginning to "take stock." Literally every day we find new proof that our splendid young commonwealth is a vast storehouse of undeveloped resources. And even were we still indisposed to claim the twentieth century as ours, the eager investors and homeseekers of the mother country and other lands will not be denied. The hands of that conservative element in our eastern provinces are being forced to grasp a new rung on the ladder of progress by the pulsing life of "The West." Nation-building is great fun, and Johnnie Canuck is into the game.

Now, nation-building implies the creation of permanent industries, among a contented people; hence, if "forestry is the parent of industries," what step more natural than to find out as quickly as possible our forest areas and their condition and environment, in order that a rational policy of development for this generation and unselfish conservation for coming generations may be adopted? At present all our federal reserves lie beyond the Great Lakes. The Westerner, brimfull of energy as he is, is still an opportunist and thinks only of the present. Few look ahead even five years, and much the same fight on behalf of future citizens that has been waged and won in the western states of the great American republic must here, too, become a function and duty of good government.

Forestry costs money on the start, and costs a good deal; and the returns, though fairly opulent, are long delayed. Hence the good forester seizes every legitimate source of current revenue, in order to neutralize, as much as may be, the running expenses of protection and administration. Canada is to-day par excellence the land of game, both big and small; and, provided only that the Canadian people awake to their opportunity, is bound in the future to hold its own, and even increase its lead, in this regard. It has always seemed to me, therefore, that this question of possible game revenue merits a great deal of study from our Canadian foresters.

Of course, this feature of game preservation bulks larger in private forestry than in Government management, for the simple reason that the former owner regards it as truly a valuable asset and acts accordingly. Take the case, for instance, of the Vanderbilt estate at Biltmore, where Dr. Schenck offsets the entire cost of forest protection by the return from hunting permits. Nor has he the moose and elk—not to speak of goat, grizzly and cariboo—of our latitudes. What matter if the timber

does grow more slowly in our northland than in the "Sunny South?" By catering to the wants of tourist and hunter we need suffer no pecuniary handicap. The Land of Evangeline, the Laurentian continent and the Rockies are rapidly assuming the role of summer playgrounds to this continent and beyond. It is for the forester to take every advantage of this fact. The fishing, hunting, trapping and camping facilities must be perfected, the supply guaranteed and, in short, every effort made to place the game and fish, as well as the forest that shelters them, on a *permanent paying basis.*

It is a big question, and, much as we may wish it, can hardly be kept out of politics, unless, indeed, as in New York State, the whole oversight of the forest and its creatures be placed in the hands of a strong and independent commission. Meantime, let us study ways and means to secure the cheapest and most efficient protection, wise legislation, and, above all, a public opinion sympathetic and appreciative, because more intelligent. It is high time that sentiment, which has so long been the false guide and basis of opinion in all matters affecting game and forestry, should be exorcized. Canadians generally must waken up to the fact that our game preservation and exploitation stands, a business proposition, four-square to every argument. Exactly as in the case of timber, it rests on permanent and profitable use, based on adequate protection and reproduction.

On the Riding Mountain reserve in Manitoba is one of the finest herds of elk on the continent. During the past three summers I have had the pleasure of travelling through all parts of this, the largest and most important of our federal forest reserves. One may meet the wapiti almost anywhere, but they seem to prefer the large brule and semi-prairie tracts of the upper plateau, especially in the west end. The moose, on the other hand, enjoy shelter and prefer the more heavily timbered east end, or the Duck Mountains to the north. Sad to say, the elk are dwindling. The greatest danger to the future of this herd is probably not the settler, with his occasional victim throughout the year, but rather the horde of outsiders who scour the woods in the open season, shooting at everything that moves (and even at the stumps!)

What, then, it will be asked, is the simplest step that can be taken to overcome this danger? The suggestion is made that the policy be adopted—both on this reserve and on others—that has proved so successful in the case of Algonquin Park in Ontario. There the deer have come to appreciate the situation, and, as the rangers will testify, from the surrounding highlands of Ontario they make for its friendly shelter every fall when the open season begins. British Columbia, too, has seen the value and wisdom of this step; her excellent game guardian

reports most favorably as to its operation and calls for an extension of the scheme into a regular system of game havens. Make an adequate and inviolate retreat in the heart of each reserve, where no shooting or trapping is tolerated the year around. A good trail must be cut out all around, in order that patrol may be easy and ample; the whole value of the protective measures depends on the efficiency of this factor, especially during that crucial period, the open season.

I am well aware that this is exactly the object now being sought by the Manitoba Game Protective Association, and their Secretary-Treasurer deserves a hearty vote of thanks from every lover of wild life for his constant and untiring efforts in behalf of our vanishing game. I am only desirous of helping on the good work, and in this connection would also say that every settler and sportsman interviewed along the Riding Mountain this season was heartily in favor of this scheme.

We had two camps within the nine townships proposed to be set apart, spending a month there, and the area is exactly suited to the purpose. It includes open meadows for the elk, deer and chicken, scrub for the moose and a number of streams for the fur-bearers—not to mention Clear Lake for whitefish, Shoal Lake for ducks, and others filled with pickerel. To the beaver it would mean salvation. But, were it only for the sake of the elk, the step is imperative. Every sportsman should bestir himself in their behalf and bring pressure to bear on the powers that be. These words of Mr. Bryan Williams are not more true in British Columbia than in Manitoba: "The elk is about the easiest of all game animals to kill, and thus is in need of the greatest protection. On the mainland, where it was at one time found in large numbers it is almost extinct, and the same fate must await it on Vancouver Island. . . There is no nobler game animal on the face of the earth, and for this reason, apart from its great value as an asset, every means should be taken and no expense spared to save it from extinction." The immediate setting aside of this proposed area in the Riding Mountains would appear, therefore, very desirable, especially as the game preservation will in no way conflict with the uses of forestry.

Apropos of game revenue on this reserve arises another interesting question. Why should the provincial government enjoy the hunting-license revenue, while the Dominion Government is at all the expense of protecting and administering the reserve? This seems an anomaly and scarcely fair to the Dominion Government. Federal jurisdiction is recognized in all other products of the reserve; why make an exception of the game? It may be urged that this source of revenue would be relatively trivial. This is not the case. The current expenditure on this reserve runs about $10,000, while last year the

return (solely from timber and hay permits) was only some $7000. The $3,000 of hunting-license revenue would therefore have exactly balanced the account. Nor would the game be so ill-protected as many seem to fear, for this work would no longer be everybody's business, and hence, perforce, nobody's.

Good as our Canadian game laws are on the whole, there are still a few loopholes to fill and improvements to make. Take, for instance, the case of the trappers on this reserve. As early as September we found these men building shacks and preparing to stay all winter; yet they had paid no license and were not even required to take out a permit. Is this not a mistake? Even if the revenue were overlooked, the mere fact of taking out a permit and resultant affidavit would give the game warden a valuable check on their movements and go far to prevent the illicit killing and sale of big game which, I am credibly informed, is the common practice of these gentlemen.

As to the vexed question of game control, it seems hard to hit on the right solution. The western people claim Ottawa is too far away to keep in close touch and sympathy with the needs of their game, and point in alleged proof to the case of the fish. To a disinterested observer it must appear that there are, under present conditions, too many sets of underpaid officials, all taking a hand at the game. One well-paid man who does not have to farm or buy cattle, or run hotel most of the time in order to make ends meet can actually *do* the work that a dozen average deputy game wardens are supposed to do. British Columbia has proved that. The moral, then, is to concentrate. Wherever possible, place forest, fish and game under one strong commission (to exclude politics) and let their basic axiom be "Good work, good pay."

In her countless delightful nooks from ocean to ocean, in her rich and varied fauna, in her magnificent scenery, in her glorious summer season, Canada has a resource which, though it will cost us but little to maintain, yet promises untold millions of wealth. If Canadians will exert themselves only a little, our country will be the Mecca for wealthy fun-seekers and sportsmen from all lands; and exchanging fun for money is more profitable than gold mining, or even growing "Alaska "wheat. Shall we not do this? In that case, our forests, besides supporting a great lumber industry, will, with all they imply, be the chief cornerstone also of this rich auxiliary resource. In conclusion, therefore, we naturally appeal once more to the forester—and that with confidence—as the man whose efforts and enthusiasm for this ideal must win and inspire Jack Canuck to "organize and advertise and realize."

[Photo by N. M. Ross.

White Spruce Seeding the Prairie, Sprucewoods Reserve, Manitoba.

THE DOMINION FOREST RESERVES.

By A. Knechtel.

Introductory.

It would almost seem as if the white race had begun wrong on this continent. Needing cleared land for agriculture we started in the woods, and now when we need woods we start on the cleared land. The arrangement was not an economic one. The prairie should have been located near the Atlantic and the woodland in the Northwest. Arranged as it was, with the forest on the land that was close to the market for its products, forest destruction was at first a necessity, and later became a habit. Fire, the good servant in clearing the land, ran rampant carrying forest devastation far beyond the necessities of the people.

The earliest settlers, coming from Europe were used to forest conservation. They had practised it in the countries from which they came. Forest destruction was to them a new thing; but the forests were so vast that they thought there could never be a scarcity of wood, and they reasoned that the more the forest was destroyed, the more the agricultural interests of the country would be advanced. But the modern settler sees the forest in a different light, especially so in the great Northwest where on the wide prairie wood is a luxury. To him forest conservation is the necessity, not forest destruction. He has no delight in the devastation of the woods by fire, and he hails with hope legislation and management tending to improve the condition of the forest. He sees clearly that his comfort and his agricultural interests are closely dependent upon a plentiful supply of wood.

The country is so vast and the demand for wood so great, it is a tremendous problem to so manage the forests that this demand may be met continuously. Hope seems to lie in the creation of forest reserves, and the policy of setting aside land to be used as forest reserves is now pretty well established by the Dominion Government.

The Dominion Forest Reserves are intended to preserve and produce a perpetual supply of timber for the people of the prairie, the homesteaders' needs being considered of first importance. They are not intended to furnish wood for the lumber trade. Hence the policy of the Department is favorable to small mills rather than to large ones which need large tracts of forest and

manufacture lumber beyond the needs of the settlers. To furnish wood is primarily the purpose of Parliament in the creation of the reserves. To be sure, our legislators are not unmindful of other blessings of the forest. They are well aware that forests feed springs, prevent floods, hinder erosion, shelter from storms, give health and recreation, protect game and fish, and give the country aesthetic features. However, the Dominion Forest Reserve policy has for its motto, "Seek ye first the production of wood and its right use and all these other things will be added unto it."

Location and Area.

The Dominion Forest Reserves all lie in the northwestern provinces. They are twenty-six in number, including the parks whose timber is managed in precisely the same way as that of the timber reserves proper. The number twenty-six does not include the eastern slope of the Rockies, however, although it also is under management similar to that of the forest reserves. Manitoba has six reserves, namely:

Riding Mountain Reserve, containing	1535	sq.	miles.
Duck Mountain " "	1251	"	"
Porcupine No. 1 " "	322	"	"
Lake Manitoba West " "	248	"	"
Spruce Woods " "	110	"	"
Turtle Mountain " "	109¼	"	"
Total.....	3575¼	"	"

Saskatchewan has four, namely:

Porcupine No. 2 Reserve, containing	360	sq.	miles.
Moose Mountain " "	163	"	"
The Pines " "	145	"	"
Beaver Hills " "	72	"	"
Total.....	740	"	"

Alberta has six, namely:

Jasper Park Reserve, containing	5000	sq.	miles.
Rocky Mountain Park Res."	4500	"	"
Cooking Lake Reserve, "	114	"	"
Kootenay Lakes, "	54	"	"
Cypress Hills "	18	"	"
Elk Island "	16	"	"
Total	9702	"	"

British Columbia has ten, namely:

Yoho Park Reserve, containing	828½	sq. miles.
Glacier Park " "	576	" "
Hat Creek " "	208	" "
Long Lake " "	190	" "
Tranquille " "	149	" "
Niskonlith " "	124½	" "
Monte Hills " "	106	" "
Donald " "	72	" "
Larch Hills " "	25	" "
Martin Mountain "	18	" "
Total.....	2295	" "

Summarizing:

Manitoba has	3,575¼ sq. miles	2,288,160	acres.
Saskatchewan	740 " "	473,600	"
Alberta "	9,702 " "	6,209,280	"
B. C. "	2,295 " "	1,467,800	"
Grand Total 16312¼		10,438,840	"

Dates of Formation.

The Dominion Government awoke to the necessity of forming forest reserves in 1887, and has been constantly moving forward in that direction, thus conserving the timber, ever since that date, as appears from the following table which gives the dates when the reserves were set aside.

1887, June 23,—Rocky Mountain Park Reserve, by Act of Parliament.

1888, Oct. 11,—Glacier Park Reserve, by Order in Council.

1894, Dec. 29,—Moose Mountain Reserve, by Departmental Order.

1895, May 30,—The Kootenay Lakes Reserve, by Order in Council.

1895, July 13,—Riding Mountain Reserve, by Departmental Order.

1895, July 13,—Lake Manitoba West Reserve, by Departmental Order.

1895, July 13,—Spruce Woods Reserve, by Departmental Order.

1895, July 13,—Turtle Mountain Reserve, by Departmental Order.

1899, June 5,—Cooking Lake Reserve, by Departmental Order.

1901, Dec. 14,—Yoho Park Reserve, by Order in Council.

1901, Aug. 29.—Beaver Hills Reserve, by Departmental Order.

1902, Nov. 3 —Long Lake Reserve, by Departmental Order.

1902, Nov. 3—Rocky Mountain Reserve, extended 152 townships by Act of Parliament.
1903, Nov. 26,—Glacier Park Reserve extended 16 townships by Order in Council.
1905, Nov. 14,—The Pines Reserve, by Departmental Order.
1906, July 13,—Duck Mt. Reserve, by Act of Parliament.
1906, July 13,—Porcupine No. 1" "
1906, July 13,—Porcupine No. 2" "
1906, July 13,—Cypress Hills " "
1906, Jnly 13,—Monte Hills " "
1906, July 13,—Martin Mountain" "
1906, July 13,—Niskonlith " "
1906, July 13,—Tranquille " "
1906, July 13,—Hat Creek " "
1906, July 13,—Donald " "
1906, July 13,—Larch Hills " "
1906, July 13,—Elk Island " by Order in Council.
1907, Sept. 14,—Jasper Park. " " " "
Sept. 17,—Yoho Park, reduced 105 sq. miles, by Order in Council.

The work of making forest reserves is still progressing, and will need to progress in Canada for many years. This year the region around the Waterton Lakes in southwestern Alberta was examined for this purpose. The forester who examined it recommended that 195 square miles be set aside. Also, territories adjacent to certain reserves have been examined with view to ascertaining their suitability to be added. Recommendations have been made that 130 square miles be added to the Spruce Woods Reserve in Manitoba, 238½ square miles to the Pines Reserve in Saskatchewan, 45 square miles to the Beaver Hills Reserve in Saskatchewan and 192 square miles to the Cypress Hills Reserve in Alberta.

It is the policy of the Department in throwing open territories for settlement, to put into forest reserves all land that is unsuited to agriculture or grazing, and in making these examinations the foresters have kept this policy in mind.

Grazing on Forest Reserves.

It is not the policy of the Department, however, to exclude from the reserves all land suitable for grazing. In fact, they already include large grazing areas, and, if the recommendations made this year be sustained, such areas will be added to the Cypress Hills and Beaver Hills. These areas are among timber, and so we include them, rather than to exclude the timber. Nor is it the policy of the Department to prevent grazing on these areas. For several reasons it is desirable that they should be grazed. The forest reserves are for the use of

[Photo by S. Witten

Grazing, Riding Mountain Reserve, Manitoba.

[Photo by S. Witten

Forest Survey Party, Summer 1908.
Riding Mountain Reserve, Manitoba.

the people; then why should good grass be allowed to go to waste if it can be utilized? The grazing may be desirable also as a protection to the woods. In some places the ground is covered with a dense growth of long grass and peavine. This, when dry, offers much fuel for fire; and when the fire once gets into it, it is almost impossible to check the flames. Cattle on the prairie have much the same habit as the buffalo. In going to water they follow one another and make paths which they follow day after day. These paths are fire lines where the fire may be checked, small to be sure, but there are many of them, and they give lines from which to back-fire.

Perhaps it will be objected that grazing prohibits the reproduction of timber. It seems to me, however, that the interference with reproduction from this cause is much overestimated. I know in the West many fields grazed constantly that have come into timber. There is danger from overgrazing, but from judicious grazing there is much less danger than from long grass and peavine.

Protection Against Fire.

The problem of protecting the forest reserves against fire is the most difficult one we have. The fire problem is difficult even in the eastern provinces; but the conditions for fighting fire here are very favorable as compared with those prevailing in Manitoba, Saskatchewan, Alberta, and eastern British Columbia. Compare, for instance, the number of rainy days for the summer months at Calgary, Alberta; Qu'Appelle, Saskatchewan; Winnipeg, Manitoba; and Toronto, Ontario. In our comparison, however, we must not only consider the number of rainy days but also the quantity of rain falling on those days; because, although a day may be considered rainy, there may not be precipitation enough to count much towards putting out a forest fire. The following table is a comparison for the four places mentioned, showing the average number of rainy days in each of the summer months, and the average quantity of rain falling in those months. It is compiled from statistics furnished by the Meteorological Service published in a volume entitled "Rain and Snow-Fall of Canada."

TABLE OF RAINY DAYS.

(AVERAGE 1883 TO 1902—20 YEARS.)

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Calgary, Alta.....	0.20	0.06	0.33	2.93	9.40	12.93	12.00	8.66	6.93	2.79	2.66	0.26	59.15
Qu'Appelle, Sask....	0.25	0.30	0.40	4.00	8.80	12.65	11.90	8.35	8.15	4.70	0.90	0.30	60.70
Winnipeg, Man.....	0.45	0.25	1.20	6.80	9.15	13.40	12.25	12.25	11.05	8.45	1.60	0.07	76.92
Toronto, Ont.....	5.30	5.75	6.70	9.30	13.30	11.35	11.95	10.35	11.05	13.20	11.15	7.45	116.85

TABLE OF RAINFALL IN INCHES.

(AVERAGE 1883 TO 1907—25 YEARS).

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.
Calgary, Alta.....	0.013	0.016	0.024	0.262	2.010	3.060	2.630	2.490	0.991	0.191	0.004	0.005	11.696
Qu'Appelle, Sask....	0.002	0.085	0.036	0.356	1.785	3.580	2.594	1.750	1.446	0.463	0.400	0.072	13.336
Winnipeg, Man.....	0.005	0.003	0.160	1.142	1.858	3.319	3.003	2.209	1.253	1.290	0.728	0.013	14.983
Toronto, Ont.....	1.128	0.954	1.360	1.467	2.754	2.844	2.856	2.624	2.855	2.532	2.104	1.563	25.041

It would appear from these tables that Toronto is at a slight disadvantage in the month of June. But of all the summer months, June, July and August offer the least danger to the forest. In these months the grass is green, the leaves are out on the shrubs and trees, the sap is in the bark, and the ground is moist from the shade of the trees. The chief danger periods are in the spring before June, and in the fall after September, when the woods are dry. The Ontario fire law is constructed upon the idea that the most dangerous period is from May 1st, to October 1st. My own observations in Ontario have led me to doubt the wisdom of that law in this particular.

The eastern provinces have a great advantage also in regard to the wind. The average hourly velocity of the wind at Winnipeg for the eight summer months of 1905, as stated by the Meteorological Service, was 14.87 miles per hour, while at Toronto it was only 7.36 miles per hour; just twice as great at Winnipeg as at Toronto. The people of the East were fortunate in that respect last summer. Had the wind here been as high as in the West, quite likely there would have been twice the quantity of timber destroyed. Then, in the East the winds are moist; there is no dry chinook.

Again, in respect to population the East has the advantage. When a forest fire starts in Ontario or Quebec, you can just

[Photo by A. Knechtel

Forest Ranger Interviewing Campers, Cypress Hills Reserve, Alberta.

go out to the 100-acre farms, and to the numerous small villages and soon have a force of men to put it under control. But in the Northwest the population is scarce, railroads are not so numerous, and telephonic communication is not so good. In that country we cannot count much on putting out forest fires and so we have to be all the more diligent to see that fires do not get started.

The reserves are under constant patrol, summer and winter. During the danger periods the rangers lay aside all other duties and guard the forest against fire. In 1908, we had only two fires of any consequence, one in the Pines Reserve which burned over 22 square miles destroying no merchantable timber, and one in the Turtle Mountains, extending over 28 square miles, mostly covered with grass. In each of these fires, however, large areas of young reproduction growth was destroyed.

Last year we began a practice which we know saved the reserves several fires. It is a well known fact that, in the early spring, the fields become bare and the grass dry before the snow is all gone from the woods. While such conditions existed the forest rangers burned the meadows along the reserve boundaries. Fires, coming in from the prairie, met this wide fire line and died out for want of fuel. Around the Riding Mountains the meadows were burned for ninety miles, around the Duck Mountains for forty-two miles, and around the Porcupine Mountains for thirty miles, all these in the most dangerous places. It is the intention to extend this practice to all the reserves wherever it is practicable, and to carry it out upon an extensive scale.

Plowed fire guards also will be made around and across some of the reserves. The forest ranger on the Cypress Hills has instructions to plow a guard of four furrows entirely around the reserve, and outside of this four rods distant from it a second guard. Then, on calm days, with the help of two or three men he is to burn the grass between the two guards. On the Spruce Woods Reserve several guards will be plowed, one of which will run along each side of the Canadian Northern Railway which crosses the reserve.

Roads along the boundaries and through the reserves are being constructed to aid in fighting fire. One hundred and fifty miles was made this year. In certain places these roads are very much needed. For instance, I noticed in my inspection of the Turtle Mountain Reserve that the roads all run north and south. There is no way of going promptly and conveniently east and west. The fires mostly come in from Dakota which lies to the south. Therefore, to facilitate the fighting of fire the forest ranger was instructed to make a road follow-

ing the southern boundary. This will not only make it easier to move about on the reserve but it will serve as a fire line from which back-firing may be done.

Reforesting.

The Department is making an attempt to reforest some of the areas denuded by fire. From some experiments made last spring, it would appear that this might be accomplishable by putting down a few seeds with a handful of sand over them at each place where we wish to have a forest tree. This was tried on the Turtle Mountains and on the Spruce Woods Reserve. In the former it was successful, in the latter unsuccessful. On the Turtle Mountains the seed was thus placed under poplars and among long grass. The following species were planted: White Pine, Norway Pine, Jack Pine, Bull Pine, White Spruce, Red Spruce, Colorado Blue Spruce, Engelmann Spruce and Balsam. Among the poplars the seed was evidently taken by birds, rodents or insects; but in the long grass every species germinated, and just before snow-fall the trees were alive and looking well.

It is intended to carry on a variety of such experiments next summer. For this purpose the forest ranger on the Spruce Woods Reserve collected last fall 40 bushels of Spruce cones, the ranger on the Cypress Hills 40 bushels of Lodgepole Pine, and a party of foresters working on the Pines Reserve 50 bushels of Jack Pine. These are the species with which we hope to achieve success as they are the ones likely to prove hardy.

We shall do our best to win along this line, because the method of raising trees in nurseries until they are three or four years old and then setting them out into the field is far too slow and too expensive a method to count much towards meeting the demand for wood that will develop on this continent during the next hundred years. The nursery method is simply gardening. It is a good method for the farmer's wood-lot. Foresters should, however, seek for a method commensurate to the needs of the Government lands. In the meantime, however, we are not despising the gardening method even on the reserves. We may be forced to use it, and next spring we shall start some seed beds. In fact 35,000 trees have already been planted on the Spruce Woods Reserve, from stock raised at the Forestry Farm at Indian Head.

Removal of Squatters.

A large number of people, mostly foreigners, had located and started farming operations upon the reserves, expecting some time in some way, political or otherwise, they would be permitted to make entry for the places they occupied. The

Department determined upon their removal. They numbered one hundred and twenty-six on the Riding Mountain, and twenty-five on the Turtle Mountain Reserve. The task of removing these people was a delicate one and required great judgment and courage on the part of the forest rangers. The chief ranger of the Riding Mountains, W. A. Davis, devoted the entire summer to the work. All the squatters have been removed except three on the Riding Mountains and two on the Turtle Mountains. These remaining ones will move early next spring.

In this work the Department followed a lenient policy. The squatters were taken to look over lands in wagons furnished to them free of charge. They got free entry for the lands they selected, and they received compensation for improvements they had on the forest reserves. The total cost of removing all these people was only $6,000. They have all made affidavits stating that they have been well treated and are pleased with the change.

Marking Reserve Boundaries.

In order that the public may not unintentionally trespass upon the forest reserves thinking themselves on private property, or on other Dominion lands, the Department began last year to mark the boundaries with iron posts. These are three-cornered and hence differ in shape from the regular Dominion survey posts. They are marked with the letters "D. F. R." (Dominion Forest Reserve) and the part that projects out of the ground is painted red so that it will be readily observable, summer and winter.

Considerable work was done in this direction last year. Mr. David Beatty, a Dominion Land Surveyor, was at work with a party of men on the unsurveyed portion of the boundary of the Porcupine Reserve and ran fifty-one miles of the line. The forest rangers are working on the boundaries that have been surveyed and have located 140 miles.

This work was in many places difficult of accomplishment. It was about thirty years since the lines had been surveyed and some of them having been burned over, the wooden posts had been destroyed and the mounds almost obliterated. People familiar with the West know, also, that mosquitoes and flies are numerous and troublesome in the summer months. As it is the intention to have the boundary line a road from which fire can be fought it was cut out from six to eight feet wide.

Much more of this work would have been done if the rangers could have begun early in the spring. But during the early part of the summer they were all busy with the removal of squatters.

Forest Survey.

In order that the Department may have a thorough knowledge of the reserves and become able to form judgment as to how the tree growth thereon should be managed, a timber and topographic survey is being conducted. Last summer Assistant Inspector MacMillan with a party of five forestry students conducted such survey of the Pines Reserve. Assistant Inspector Dickson did similar work with a party of thirteen in the Riding Mountains. It is the intention to have four such parties on the reserves next summer. This survey serves a double good purpose. It gives the Department the knowledge it desires and gives the students the practical side of their forestry course.

The timber survey makes a thorough study of the tree growth. It gives the areas covered with mature timber and with younger timber and states the quantity of each. It considers the accretion and the reproduction of timber in the forest and discovers means for their encouragement in quantity and quality. It examines areas having no tree growth, and recommends methods by which they may be afforested. It studies the effect of past management upon the forest, and advises improvements for the future. It suggests means by which dangers to the forest from fire, storms, fungi and insects may be reduced. It investigates the utilization of the forest, and seeks new uses for forest products.

The topographic survey describes the hills and valleys, the lakes, streams and trails. It studies the best routes for the removal of the mature timber and locates trails for protecting the forest against fire.

Kinds of Timber.

The following species of trees exist in commercial quantity on the forest reserves:—

Poplar (*Populus tremuloides* Michx.) and Balm of Gilead (*Populus balsamifera* Linn.) exist on all reserves east of the Rockies. Poplar reaches a maximum size of 32 inches at breast height. Fifteen inches, however, is the largest common size for sound trees. Balm of Gilead reaches a maximum of 34 inches, with a common large size, sound, of 18 inches.

White Spruce (*Picea canadensis* [Mill.] B.S.P.) and Black Spruce (*Picea mariana* [Mill.] B.S.P.) exist on all reserves east of the Rockies except Turtle Mountain, Moose Mountain, Beaver Hills, Cooking Lake, Elk Island and Buffalo Park reserves. Maximum 48 inches; common large, sound, 18 inches.

Engelmann Spruce (*Picea engelmanni* Engelm.) exists on the Kootenay Lakes, Jasper Park, Rocky Mountain Park and

[Photo by J. F. Clark

Western Cedar and Black Pine,
Rocky Mountain Park Reserve, Alberta.

all British Columbia reserves. Maximum 30 inches; common large, sound, 16 inches.

Jack Pine (*Pinus banksiana* Lamb.) exists on all Manitoba reserves except the Spruce Woods and Turtle Mountain. In Saskatchewan it appears in the Porcupine and the Pines reserves. Maximum 20 inches; common large, sound, 12 inches.

Lodgepole Pine (*Pinus contorta, var. Murryana* [Engelm.] B.&W.) exists on the Cypress Hills, Kootenay Lakes, Jasper Park, Rocky Mountain Park and all British Columbia reserves. Maximum 20 inches; common large, sound, 14 inches.

Bull Pine (*Pinus ponderosa* Laws.) exists on all British Columbia reserves. Maximum 36 inches; common large, sound, 26 inches.

Western White Pine (*Pinus monticola* Dougl.) exists on all British Columbia reserves. Maximum 32 inches; common large, sound, 24 inches.

Tamarack (*Larix americana* Michx.) exists on all the Manitoba reserves except Turtle Mountain. It occurs on the Pines and Porcupine reserves in Saskatchewan, and on the Jasper Park in Alberta. Maximum 24 inches; common large, sound, 14 inches.

Western Larch (*Larix occidentalis* Nutt.) exists on all the British Columbia reserves. Maximum 30 inches; common large, sound, 24 inches.

Douglas Fir (*Pseudotsuga mucronata* Sudw.) exists on the Kootenay Lakes, Jasper Park, Rocky Mountain Park and all British Columbia reserves. Maximum 36 inches; common large, sound, 24 inches.

Balsam (*Abies balsamea* [Linn.] Mill.) exists on Riding Mountain, Duck Mountain, Porcupine and Lake Manitoba West reserves. Maximum 17 inches; common large, sound, 10 inches.

Western Cedar (*Thuja plicata* Don.) exists on all British Columbia reserves. Maximum 84 inches; common large, sound, 40 inches.

Western Hemlock (*Tsuga mertensiana*, authors) exists on the British Columbia reserves. Maximum 35 inches; common large, sound, 10 inches.

White Birch (*Betula papyrifera* Marsh.) exists on the Manitoba reserves. Maximum 26 inches; common large, sound, 14 inches.

There are also on the Manitoba reserves small quantities of merchantable Green Ash (*Fraxinus lanceolata* Borkh.). Maximum 12 inches; common large, sound, 8 inches. Bur Oak (*Quercus macrocarpa* Michx.). Maximum 27 inches; common large, sound, 10 inches. Manitoba Maple (*Acer negundo* Linn.). Maximum 11 inches; common large, sound, 7 inches.

Timber Estimates.

As has been previously stated, the Department is making a forest survey of the reserves which should give a close estimate of the timber thereon. Such estimate has been made for the Riding Mountain Turtle Mountain, Moose Mountain and the Pines reserves, and for these the following figures are probably close to the actual quantities on those reserves. For all other reserves the estimates are only tentative:—

Manitoba Reserves.

	Saw Timber.		Fuel Wood.	
Duck Mountain	300,000,000	bd. ft.	3,000,000	cords.
Riding Mountain	250,000,000	"	2,500,000	"
Porcupine No. 1	50,000,000	"	750,000	"
Turtle Mountain	1,333,000	"	135,000	"
Spruce Woods	1,000,000	"	30,000	"
Lake Manitoba West	600,000	"	40,000	"
Total	602,933,000	"	6,250,000	"

Saskatchewan Reserves.

	Saw Timber.		Fuel Wood.	
Porcupine No. 2	50,000,000	bd. ft.	500,000	cords.
Moose Mountain	5,000,000	"	130,000	"
The Pines			50,000	"
Beaver Hills			10,000	"
Total	55,000,000	"	690,000	"

Alberta Reserves.

	Saw Timber.		Fuel Wood.	
Eastern Slope	3,000,000,000	bd. ft.	50,000,000	cords.
Rocky Mountain Park	300,000,000	"	3,000,000	"
Jasper Park	100,000,000	"	1,000,000	"
Cypress Hills	2,000,000	"	100,000	"
Cooking Lake			100,000	"
Kootenay Lakes			10,000	"
Elk Island Park			10,000	"
Total	3,402,000,000	"	54,220,000	"

British Columbia Reserves.

	Saw Timber.	Fuel Wood.
Railway Belt & Yoho Park	600,000,000 bd. ft.	6,000,000 cords.

SUMMARY.

	Saw Timber.		Fuel Wood.	
Manitoba Res.....	602,933,000	bd. ft.	6,250,000	cords.
Saskatchewan Res.....	55,000,000	"	690,000	"
Alberta Res.....	3,402,000,000	"	54,220,000	"
British Columbia Res..	600,000,000	"	6,000,000	"
Total.....	4,659,933,000	"	67,160,000	"

ESTIMATE OF ANNUAL OUTPUT.

The following table showing the quantities and kinds of timber taken from the reserves is also tentative as it is only an estimate. Heretofore, the quantities of timber cut on permits granted for the reserves have not been kept separate in the records from those granted for timber on other Dominion lands. It is the intention that in future forest reserve matters shall be kept by themselves so that accurate data in regard to them can be obtained. The receipts, however, as stated in the table, may be considered as correct. The figures may seem small considering the quantities of timber removed; but it should be borne in mind that every homesteader is entitled to one free permit.

TIMBER CUT DURING YEAR ENDING MARCH 31ST, 1908.

DISTRICT.	Lumber. Ft. B.M.	Logs. Lineal ft.	Cordwood. Cords.	Fence Posts. No.	Fence Rails. No.	Poles. No.	Receipts.
Manitoba Reserves.....	3,789,180	17,134	3,647	31,100	22,650	8,250	$ 7,044.41
Saskatchewan Reserves.....	343,435	464,110	9,029	117,140	106,510	102,414	535.35
Alberta Reserves.....	1,400	332,612	1,280	52,080	247,155	48,265	56.75
British Columbia Reserves...	8,338,000		2,500				4,794.00
Eastern slope, North as far as Brazeau River.....	31,651,610		56,037	336,860	1,336,700		19,325.00
Totals.....	44,123,625	813,856	72,493	537,180	1,713,015	158,929	$31,755.51

Throwing these different kinds of material into saw timber and cordwood we have saw timber about 45,751,325 board feet; cordwood 105,943 cords. Dividing these quantities into the quantities estimated as standing on the reserves and we perceive that the saw timber should last for one hundred years, and the cordwood for six hundred and thirty-four years, practically forever, providing that the rate of consumption remains the same and that no timber be destroyed by fires or other causes. To be sure the growth has not been taken into account, but it is reasonable to suppose that fires will at least offset the growth, be we ever so vigilant.

THE REMOVAL OF TIMBER.

The cutting of timber on the forest reserves is under the control of the Superintendent of Forestry. In the Moose Mountain, Turtle Mountain, Spruce Woods and Cypress Hills Reserves no wood except dry or fallen timber is allowed to be cut. On these reserves there is no mature timber and the restriction is necessary to save the young trees which would otherwise be cut as soon as they would become usable. On all other reserves both dry and green timber may be cut.

Permits to cut dry wood up to twenty-five cords are granted free of dues, only a small office fee of twenty-five cents being required as on all permits. Permits are granted to cut dry wood for sale or barter up to one hundred cords at the rate of twenty-five cents a cord.

A homesteader is allowed one free permit and only one, to cut either dry or green timber if he has no timber suitable for his purposes on his own place. A free permit may be issued for the following quantities:—

(*a*) 3,000 lineal feet of building timber, no log to be over 12 inches in diameter at the butt end, unless the timber is cut from dry trees, in which case timber of any diameter may be taken. If the building timber is to be sawn at the mill the permittee is entitled to receive free of dues enough timber for 9,250 feet of lumber, and no more.

(*b*) 400 roof poles to be used for such purpose.

(*c*) 500 fence posts, 7 feet long, and not to exceed 5 inches at the small end.

(*d*) 2,000 fence rails.

In Manitoba, Saskatchewan, or Alberta, a settler who loses his dwelling or other building by fire not due to his own carelessness, is entitled to a free permit for timber to replace it. The quantity, however, must not exceed the amounts stated above.

Any bona fide settler who has not a sufficient supply on his own farm may be granted each year a permit for the following quantities of timber at the prices here stated:—

10,000 feet board measure of building logs for lumber, no tree to be cut which is of less diameter than ten inches at breast height, or at four and one-half feet from the ground:

Poplar..... @ $1.50 per thousand feet.
Other Species..... @ 3.00 " "

500 fence posts, seven feet long, not to exceed five inches in diameter at the top:

Poplar and Willow..... @ 2c. each.
Other Species..... @ 5c. "

500 fence rails or roof poles, not to exceed six inches in diameter at the butt:

Poplar only..... @ 2c. each.
1,000 lineal feet of round building material, no log to exceed twelve inches in diameter at the butt:
Any Species..... @ 1c. per lineal ft.
15 cords of fuel:
Poplar only..... @ $1.00 per cord.

Timber cut without permit in the reserves is seized by the forest rangers, and double dues are charged upon it. If the dues are not paid the timber is disposed of at public auction. If no bid is received equal to the amount due the Government the wood may be disposed of by private sale. During 1908 the rangers seized 190,626 feet, board measure, 900 fence posts and 16 loads of cordwood, and collected as dues $1,101.61 with some seizures still unsettled.

Up to the present time permits have been granted only to actual settlers living within fifty miles of the nearest boundary of any reserve. This limitation is under consideration. There is very little wood in southern Manitoba and scarcely any in Saskatchewan, and it is a question if the people all over these provinces should not be allowed the use of the mature wood of the forest reserves. It may not be quite justice to allow only the people living in the immediate vicinity of the reserves to have all the blessings.

It is a question also, if it is wise to allow only settlers to cut the timber. The average settler in taking out timber has little care for the future of the forest. His only object is to get out the timber he needs as easily as possible. If one tree has all the timber he requires, but if two will furnish it more easily, he will cut the two trees. Moreover, the settlers cut high stumps leave large tops, and make no disposal of the brush. Millmen, knowing the loss in cutting high stumps and leaving large tops, and having regard for the future growth, treat the forest with much greater care. It therefore seems to me that mills should be permitted to enter the reserves, but they should enter under certain restrictions:—

(1) Only portable mills should be permitted.
(2) Mills should locate where the Forestry Branch directs.
(3) Permits should be granted for a definite tract not more than one mile square.
(4) Permits should be granted for one year only, but should be renewable at the discretion of the Superintendent of Forestry and should be cancellable at any time for violation of the regulations.
(5) Only such timber should be cut as is marked previously by the Department for removal, and no cutting should begin before the marking is completed.

(6) In cutting down the trees the stumps left should not be more than 18 inches high.

(7) The trees should be cut down with a saw.

(8) All parts exceeding 4 inches in diameter of trees cut down should be removed by the permittee, and this should be done as the cutting progresses.

(9) Brush should be cut so as to lie flat on the ground excepting along the roads where it should be piled and burned under the immediate supervision of the Department.

(10) Any unmarked trees cut down on account of the lodging of the larger trees in felling should be piled by themselves separately from the other logs, and should be considered the property of the Department to be afterwards disposed of, either to the permittee or others as considered best.

(11) The dues on timber removed should be the same as those demanded of settlers.

(12) Lumber should be sold only to bona fide occupants of homesteads, or for the purpose of erecting churches and schools in rural districts.

(13) Any lumber obtained from a permittee and afterwards sold or offered for sale should be seized by the Department.

(14) No settler should be permitted to receive from the mill in any one year more than 10,000 feet of lumber.

(15) The price of lumber at the mill should be fixed periodically by the Department.

(16) Settlers should be permitted to draw out their lumber with their own teams.

(17) Permittees should be required to keep a mill book in which should be recorded all sales, to whom made, quantity sold, and price charged.

The Department has this scheme of treating the forest already under operation. A sawmill operating in the Cypress Hills was last fall put under such restrictions, partly as an experiment, and I am glad to be able to report that the experiment is apparently a success. The owner of this mill had applied for a tract of spruce timber three-fourths of a mile square. The Department stated the restrictions. They were accepted. Assistant Inspector Dickson marked the trees to be cut, and the work of cutting began. The forest ranger of the Cypress Hills Reserve, who has the work under his supervision, writing on January 22, 1909, reports as follows: "I have been down to the Grayburn mill for a few days and was all through the bush where they are cutting. They are keeping very close to the marked trees. I told them to get the brush piled along the trails and to

get the poles out and they promised to do so. I will go down again soon and burn it."

The Reserves as Pleasure Resorts.

There are many beautiful lakes on the forest reserves and some of these are being now freely used as summer resorts. It seems to me that this should be encouraged. The campers are not a menace to the forest, in fact they are a protection, as they have personal interest in guarding the forest against fire. Besides, with campers on the lakes when a fire occurs there are people at hand to help to extinguish it. Therefore, the Department has under consideration the advisability of renting camp sites on the shores of these lakes, the leases to be made out for ten years, renewable at the discretion of the Superintendent of Forestry and cancellable at any time for any misuse or menace to the forest reserve.

The University of New Brunswick Forestry Department has issued an eight page pamphlet entitled "Forestry: the new Profession." The training required for forestry work and the opportunities afforded in government employ, work with private companies, teaching and other lines are described at length.

The West Northumberland (Ont.) Farmers' Institute at a late meeting made a formal request of the Provincial Government for the establishment of a forest reserve in that riding.

The properties of the Alfred Dickie Lumber Company in Nova Scotia have been disposed of to an English syndicate. The properties include 405,000 acres of timberlands and eight mills. The price paid was $1,567,500.

The Committee on Forestry of the Ontario Experimental Union for 1909 is composed of Messrs. E. J. Zavitz, Director; H. R. MacMillan and E. C. Drury. Mr. E. J. Zavitz is also a member of the Schools Committee, representing the forestry interest.

During 1908 some 55,000 cords of pulpwood were shipped from Chatham, N.B., to Rumford Falls, Me., and 15,000 cords from the lower Androscoggin river to Bath, Me.

GREAT BRITAIN'S AFFORESTATION SCHEME.

Great Britain has frequently been pointed out as one of the few examples of European countries that do not practice forestry. That unenviable reputation, however, bids fair to be removed if the scheme lately recommended by the Royal Commission on Coast Erosion is put into operation.

It will be remembered that enquiry into the possibilities of afforestation and its bearing on the "unemployed" was referred to the Royal Commission on Coast Erosion in March of last year, six members being then added to the original Board. A great deal of evidence has been brought together from landowners, land agents, forestry experts, head foresters, labour representatives, and other duly qualified witnesses. A well-considered report strongly advocating afforestation on a large scale is the result.

Forestry Will Pay in Britain.

The first part of the report deals with the present unsatisfactory condition of British woodlands. The circumstances that have caused the defects are described, it being shown that the difficulties are not natural or inherent, but are due to mistaken treatment or to a system of forestry having objects other than economic timber production.

The Commissioners find that "The natural conditions of soil and climate in the United Kingdom are favourable to the production of high-class commercial timber, such as is annually imported into the country in very large quantities," and that "the afforestation of suitable lands in the United Kingdom, if undertaken on an adequate scale and in accordance with well-recognized scientific principles, should prove at present prices a sound and remunerative investment."

In support of this contention a mass of expert evidence is forthcoming, and examples are given of British woodlands which have proved profitable, in spite of very indifferent management.

State Management Essential.

As the Commissioners point out, afforestation is pre-eminently a task for the State; continuity of ownership and management are assured, and the resources of the country allow of expenditure upon a scheme which, though it yields no immediate return, is ultimately distinctly remunerative. Considerations such as those affecting the preservation of game vitiate most attempts at private afforestation, but State forestry can be carried out with the single view to the production of revenue. State forestry on the Continent has long been practised

with marked success, and there seems to be no reason why trees should not be grown as well and profitably in Britain as, for example, in Germany. The trees that are grown are of the same species, climatic and other conditions are not less favourable, and prices are actually higher in Britain. The main cause is the difference in the efficiency of management and the thoroughness of technical forestry education in Germany. Until recently satisfactory facilities for forestry instruction did not exist in Britain, and so British methods are not exactly all that they should be.

Timber Famine Threatened.

For some time past it has been realized that foreign timber supplies, upon which Britain is dependent to the extent of over £30,000,000 annually, are becoming exhausted. The Commission's investigation confirms this opinion, proving beyond doubt that the outlook is extremely grave.

A constantly increasing demand for timber, together with reckless exploitation and destruction of forests by fire and other agencies, is reducing the timber resources of Canada, the United States and Northern Europe to an extent which "threatens the maintenance of supplies." In addition to this fact, the use of timber is increasing, no satisfactory substitutes being available for many of its uses.

In addition to the serious effect which the shortage of a material generally regarded as indispensable would have upon trade, there is the universal inconvenience which its absence would occasion. The only satisfaction to be gained from the point of view of those concerned in the production of timber is that prices are bound to rise. The value of imported wood has increased markedly within the last twenty years, and there is every indication that there will be a very material advance before plantations now established can yield marketable produce. The calculations of the Commission regarding the profits resulting from afforestation are not, however, based on this probable rise, but only upon present prices.

The Labor Problem.

According to its terms of reference, the Commission was required to consider the suitabilty or otherwise of unemployed labor for forestry work. This is admittedly a difficult question, for there is on the one hand the desire to help a depressed class by engaging them upon productive labor, and on the other hand the fear that their services would frustrate the objects of economic forestry and endanger the whole scheme. The Commissioners have, therefore, gone thoroughly into the matter, and have examined a very large number of witnesses. Their general

finding is that much the greater proportion of the urban unemployed are unfit to undertake planting work. However, as the total number who would receive temporary employment would be only about 18,000 at the most, the Commissioners consider that a sufficient number of unemployed persons might be found "willing to submit to and able to satisfy ordinary labor tests." In addition, much permanent employment would be afforded. This would gradually increase as the area of afforestation was extended, until ultimately about 90,000 men would find occupation in the national forests. The Commission supports the view of the Departmental Committee of 1902 that permanent employment would be provided for about ten times the population at present engaged on pastoral land of the kind that is suitable for afforestation.

Another outlet for labor would eventually be found in industries such as wood pulp manufacture, and the conversion of timber—works which at present are mainly performed abroad. The permanent laborers would be mainly, if not entirely, drawn from rural districts, where, in winter at least, a good deal of unemployment exists. The occupiers of small holdings and crofters would also benefit, as forestry work is carried out precisley at the season of the year when there is little to do on the farm.

The Commissioners clearly state that they have "in contemplation a scheme of national afforestation on economic lines." They do not advise that forestry be made an instrument of charity for the employment of those out of work in cities. Even representatives of the Labor party, when giving evidence, insisted that forestry should not be treated as a "relief" work, but should be conducted on thoroughly sound business principles.

Acquiring the Land.

According to the recommendations embodied in the report, the administration would be entrusted to a special "Board of Commissioners." It would first be necessary for this Board to ascertain the exact location of the silvicultural areas and to prepare schemes of afforestation for each scheduled district. It is proposed, moreover, to grant the Forest Commissioners powers for the compulsory acquisition of land, "on the precedent of the Small Holdings Act, 1907, so far as applicable, subject to the reservation of certain rights to private owners." This conclusion was arrived at owing to the necessity of silviculture being carried out on large compact areas, and it did not appear to the Commissioners "probable that all owners of suitable land would be ready voluntarily to sell on reasonable terms." In default of purchase by agreement, they therefore recommend that compulsory powers be obtained by legislative enactment.

The Commissioners have not overlooked the fact that an extensive area of land could not be transferred from pastoral to forestry occupation without some gradual curtailment of food supplies and displacement of labour. They calculate, however, that the production of meat (principally mutton) would only be diminished to the extent of barely 5 per cent., while much of the labour employed in the tending of sheep could be diverted to forestry operations.

Financing the Project.

In Part V. of the report the Commissioners deal with the finance of the subject, and give estimates showing the detailed working of two alternative schemes of planting, together with the monetary results which may be anticipated. Taking the larger of these schemes, it is proposed that 9,000,000 acres of land be brought under forest. Evidence was taken regarding the area suitable for afforestation, and it was found that such an area could be made available without materially encroaching upon agricultural land. The Commissioners consider that no less than 6,000,000 acres could be found in Scotland alone.

Assuming that the forests be established gradually during the next sixty years, 150,000 acres would be planted annually. In the early years the expenditure would be £90,000. This would increase gradually until at the maximum it would amount to about £3,000,000. After the fortieth year, however, the forest would become self-supporting, and at maturity a net revenue of over £17,000,000 may be anticipated. At the same time the State would be in possession of property worth £562,000,000, or after allowing for compound interest at 3 per cent., about £107,000,000 in excess of the total cost involved in its creation.

The smaller scheme involves the afforestation of 6,000,000 acres—75,000 acres to be planted annually for eighty years.

The investment would be financed by a loan, the interest on which would be defrayed out of taxation. No scheme of the kind can, of course, be inaugurated without sacrifice on the part of the present day tax payer, but as a set-off against this, there is the consideration that employment is being given to a certain number of persons who might otherwise be a burden on the rates. Furthermore, afforestation is a productive investment, creates a new industry, does not compete with private enterprise, and "more than any other apparent remedy will stem the tide of rural depopulation."

The Commission's Conclusions.

The following is a synopsis of the principal conclusions reached in the report:—

1. Afforestation is practicable and desirable.

2. Approximate available area in the United Kingdom without material encroachment upon agricultural land is 9,000,000 acres.

3. Best rotation to secure sustained timber yield requires 150,000 acres to be afforested annually.

4. Employment.

(a) Temporary—Temporary employment is afforded annually to 18,000 men during the winter months. Further, an almost equal number would indirectly derive employment in the incidental and subsidiary occupations connected with forestry. This figure might be increased in any year to meet exceptional pressure of unemployment.

(b) Permanent—Permanent employment is afforded to one man per 100 acres afforested, rising to 90,000 men when the whole area has been dealt with.

(c) Ultimate—The employment connected with subsidiary industries—conversion and manipulation, etc., of the timber crop, would afford occupation for a still larger population.

5. Any scheme of national afforestation should be on an economic basis.

6. Labour—There are sufficient unemployed persons willing to submit to and able to satisfy ordinary labour tests, who could advantageously be employed without a period of special training.

7. Finance—Afforestation represents a productive investment, and should be financed by a loan. The annual sum required for the full scheme is £2,000,000. The interest on the loan should be defrayed out of taxation. The net deficit will be £90,000 in the first year, and will rise progressively to £3,131,250 in the fortieth year, after which period the forest becomes more than self-supporting.

8. Profits—After eighty years the net revenue from the forest at present prices—which promise to be materially enhanced—should be seventeen and a half millions. This represents 3¾ per cent. on the net cost, calculated at accumulated compound interest of 3 per cent. Looked at from another point of view the State will then be in possession of property worth £562,000,000, or about £107,000,000 in excess of the total cost involved in its creation, calculated at 3 per cent. compound interest.

9. Administration and control—The afforestation scheme to be entrusted to a special Board of Commissioners. In default of purchase by agreement, land to be acquired if necessary under compulsory powers.

10. Disturbance—The acquisition of grazing areas for sylviculture might necessitate a modification of the existing agricultural system on certain farms. There is no reason to

suppose that the remaining lowland areas on such farms could not either be adapted to other forms of agriculture, or could not in many cases be profitably utilized for small holdings. The acquisition of grazing areas, private or common, should present no difficulty which cannot be satisfied by arbitration and reasonable compensation.

11. Incidental—Afforestation creates a new industry. It does not compete with private enterprise. The conversion of comparatively unprofitable lands into forests enhances the productiveness of the adjacent areas, and should promote the development of the small holdings movement. More than any other apparent remedy, afforestation will stem the tide of rural depopulation.

Recommendations of the Commission.

In view of the foregoing conclusions, the Commissioners recommend that:—

1. Parliamentary powers be obtained to—

(a) Appoint Commissioners charged with the duty of carrying out a national scheme of afforestation.

(b) Vest in them power to survey and determine what land falls under a statutory definition of "suitability," and to acquire such land as from time to time may be required for afforestation or purposes incidental thereto.

(c) Equip the Commissioners with compulsory powers for the acquisition of such land on the precedent of the Small Holding Act, 1907,so far as applicable,subject to the reservation of certain rights to private owners.

(d) Authorize the Treasury to grant the Commissioners an annual free loan for the necessary period.

2. (a) The Commissioners should prepare a general scheme of afforestation for the whole of the contemplated area, extending over the entire period of rotation.

(b) An actuarial statement should be supplied by them to the Treasury indicating when and in what manner the loan and interest would be repaid.

(c) The afforestable area should be divided into convenient sub-districts.

(d) Work should be commenced in each or as many as convenient of the districts in such a way as to provide that the earlier operations, which may be regarded as experimental, should be capable of determination or of forming part of the complete forest scheme for each district.

The signatures appended are those of all the members of the Royal Commission, namely:—

The Hon. Ivor C. Guest, M.P. (Chariman).
Sir Wm. H. Browne Ffolkes, Bart.

Sir Leonard Lyell, Bart.
Sir Wm. Matthews, K.C., M.P.
Mr. E. Stafford Howard, C.B.
Mr. H. C. Monro, C.B.
Mr. W. Phipson Beale, K.C., M.P.
Commander G. C. Frederick, R.N.
Mr. John Galvin.
Mr. H. Rider Haggard.
Dr. T. J. Jehu.
Mr. A. Levy Lever, M.P.
Mr. R. Beattie Nicholson (Town Clerk of Lowestoft).
Mr. Patrick O'Brien, M.P.
Professor Wm. Somerville.
Mr. Fraser Story, F.R.S.E.
Mr. Thomas Summerbell, M.P.
Mr. John Ward, M.P.
Mr. A. Stanley Wilson, M.P.

The signature of the last-mentioned is made with a reservation, which forms an appendix to the report.

Between fifteen and sixteen million feet of pulpwood will be shipped in the spring from New Brunswick by the Bay Shore Lumber Company, St. John, N.B., to their mills in Maine.

The sum of $350,000 will, it is said, be spent by English capitalists in establishing a pulp mill at Powell River, B.C.

The British Columbia provincial estimates include an item of $37,000 for fighting forest fires, and for the services of log scalers.

THE CONSERVATION CONFERENCE.

The United States now has 550,000,000 acres of forested lands, or about one-fourth of the total land area of the continental United States. The original forests covered not less than 850,000,000 acres. Publicly owned forests cover one-fourth of the total and contain one-fifth of the timber standing; privately owned forests cover the remaining area and contain the remainder of the timber standing. Scientific forestry is now practiced on seventy per cent. of the publicly owned forests and on less than one per cent. of the privately owned forests. The total yearly growth of the forests of the United States is less than seven billion cubic feet; there are taken from the forests each year, including waste in logging and manufacture, 23,000,000,000 cubic feet, or more than three times the annual production. The United States uses annually 100,000,000 cords of firewood; 40,000,000,000 feet of lumber; more than 1,000,000,000 posts, poles and fence rails; 118,000,000 hewn ties; 1,500,000,000 staves; 113,000,000 sets of headings; 500,000,000 barrel hoops; 3,000,000 cords of native pulpwood; 165,000,000 cubic feet of round mine timbers, and 1,250,000 cords of wood for distillation. Not less than 50,000,000 acres of forest land are burned over annually, and since 1870 forest fires have destroyed each year an average of fifty lives and $50,000,000 worth of timber. One-fourth of the standing timber is left or otherwise lost in logging; the boxing of long-leaf pine for turpentine has destroyed one-fifth of the forests worked; the loss in the mill is from one-third to two-thirds of the timber sawed, and the loss in the mill product, from seasoning and fitting for use, is from one-seventh to one-fourth. In other words, only 320 feet of lumber is used for every 1,000 feet that stood in the forests. The lumber cut has increased less than fifteen per cent. in the last years, but the average price at the mill, for all kinds of lumber, has risen forty-nine per cent., and the rise continues. Misuse of the forests is invited by over-taxation and in one year fire destroys timber enough to supply the whole country for three months. To protect farms from wind and to make stripped and treeless lands productive, there hould be planted an area larger than that of the states of Pennsylvania, Ohio and West Virginia combined; so far, lands planted to trees make a total area smaller than that of Rhode Island. By reasonable thrift the country can produce a constant timber supply beyond the present needs and with it conserve the usefulness of our streams for navigation, power, irrigation and water supply. The conservation of public forests is the smaller task before the nation and the states; the larger task

is to induce private owners, to the number of three millions, to take care of what they have, and to teach woodusers how not to waste. Forest fires must be stopped; by careful logging and other methods, waste must be reduced and cut-over lands left productive; by preservative treatment, the timber logged must be made to go further; needless waste in the mill, the factory and in use must be avoided. The lands, now treeless, which will be most useful under forests, must be planted up; taxes must be so adjusted that cut-over lands can be held for a second timber crop, and the fact must be recognized that timber costs no less to grow than to log and saw. The nation and the individual states must continue and perfect the preservation by wise use of the forests already publicly owned, and the same treatment must be extended to other mountain forests more valuable for the permanent benefit of the many than for the profit of the few.

The above is a summary, taken largely from "Conservation's" excellent account, of the report of the Section on Forests of the National Conservation Commission, given at the Conservation Conference which convened in Washington, D.C., on December 9th and 10th last.

The session of Thursday morning, December 10th, was devoted to the consideration of forest preservation. The chief speakers of the morning were Senator Reed Smoot, of Utah, Chairman of the section; Hon. W. C. Edwards, who represented the Canadian Government; Mr. Andrew Carnegie and State Forest Commissioner Whipple, of New York State.

Senator Smoot, after referring to the very complete report that had been presented, spoke of three great conclusions which sprang from the commission's report: first, the forest problem before the nation, the state and the individual was grave and urgent; second, they could solve this problem if they would act unitedly, vigorously and immediately; third, if they failed to act, the possibility of a satisfactory solution would be rendered doubtful, or even wholly removed. No nation had a more wholesome and enthusiastic sentiment for the right use of the forests than had the people of the United States, but no nation took poorer care of its private forests than they. The time had passed when the preservation of the forests was merely a debt they owed posterity. For their own immediate welfare the conservation of the forests, public and private, was absolutely essential and imperative for their industrial and commercial welfare.

Hon. Mr. Smoot then went over, with suitable comment and illustration, a number of the points of the report and went on to speak of some action that must be taken. Private owners must have impressed upon them the need of practicing reasonable economy in the woods, in logging, in milling and in the use of

lumber, and, above all, the need of protecting their forests from fire, of protecting the young growth and of replanting denuded areas of absolute forest soil. Upon the states was imposed the necessity of immediately passing tax laws which would enable private owners "to protect and keep productive under forest those lands suited only for forest growth." He did not believe that such a policy would have the effect of enabling great monopolies to secure more land and hold it where the timber would not be taxed. His study of the question in foreign lands, particularly in Germany and Switzerland, showed him that the result had been rather the opposite.

The speaker was strongly in favor of a "produce tax." "Taxes on the forest land should be levied on the crop when cut, not on the basis of a general property tax." Another task binding on the states was the passage and actual enforcement of adequate fire laws, a matter which entailed the employment of a trained force whose first duty was fire patrol. Upon the Federal Government lay the task of adequately protecting and conservatively using the whole of the public forest lands. Touching on the question of the Appalachian Forest Reserve, Senator Smoot spoke strongly of the urgent necessity of speedy action in carrying out that scheme. In regard to the country's timber supply, he believed that if action were taken at once, they had still forest enough to supply, under right management. the timber the nation needed.

After short addresses by Messrs. Page, of Virginia, and Howell, of Wyoming, Senator Edwards was called on for a short address. After giving expression to the feelings of good-will which existed between the United States and Canada, he conveyed special messages from His Excellency the Governor-General and Sir Wilfrid Laurier, the former one of cordial agreement with Mr. Pinchot's policies, the latter suggesting more stringent laws in regard to the prevention of forest fires originating from the railways. In regard to the conservation of their forest resources, the situations of the United States and Canada were very similar. The most essential measure for forest preservation was the prevention of forest fires. Canada, he believed, if she acted promptly, could always supply her own timber needs. He had been especially impressed through the conference in learning of the part water would take in conserving the supplies of coal and iron, in the one case through the use of water for power, in the other by the use of the water courses for transportation. He believed the use of cement would also have its part in conserving the iron supply. He concluded by speaking of the import of lumber into Canada from the United States and hoped it would continue, for it would conserve Canadian timber.

Mr. Andrew Carnegie also made a very brief address,

speaking of the relation between the federal government and the state governments and the bearing of this on the conservation of natural resources, and added a few words, in a humorous vein, regarding the relations of Canada and the United States and their ultimate union.

State Forest Commissioner J. S. Whipple, of New York State, gave an address that was one of the features of the morning session. He emphasized the enormous destruction of the forest and the need for reproduction. "In twenty years, at the rate we are going, not one sawing stick will stand in the State of New York, and we are even now getting eighty-eight per cent. of our pulpwood from Canada." He insisted on the need of planting as a remedy for this state of affairs. His advice to the governors was "Go home and establish a Commission . . . . and put a Pinchot at the head of it. Then furnish it money and don't . . . implore the National Government to set aside some state land as a National Forest; do it yourself." Coniferous trees had to be planted, though hardwood trees would attend to their own reproduction. Millions of pine trees should be planted every year. A vigorous propaganda was the next essential; in New York it had taken them twenty years to do the preliminary work, and only within the last three years had they got the people of the state roused. Mr. Whipple spoke of the people of the City of New York expending $150,000,000 to build a reservoir in order to ensure a water supply for the city; but that expenditure would be useless unless they protected the forests of the Catskills, whence the water came. The Commissioner then spoke of the necessity of forests for water, and hence for agriculture, especially in the East. In New York they were spending $500,000 to $1,000,000 per year in buying land for their forest reserves, and that expenditure they intended to keep up. The speaker concluded by strongly exhorting the representatives of other states to have their states make forest reserves and start planting them up.

At the conclusion of Mr. Whipple's address Governor Johnson, of Minnesota, rose and asked Mr. Whipple to give some practical scheme, and an interesting discussion took place between the two.

Other speakers during the session were Mr. Lathrop, representing the Alabama State Conservation Commission; Dr. Geo. C. Pardee, formerly Governor of California; President Evans, of the American Automobile Association, who is a member of the Pennsylvania State Conservation Commission; Governor Blanchard, of Louisiana, and Prof. Rane, of the Massachusetts State Conservation Commission.

The Public Meeting.

The Conference was opened by a great mass meeting at

the Belasco Theatre. This was presided over by President-elect W. H. Taft, who was introduced by Mr. Gifford Pinchot, the temporary Chairman.

The speakers of the evening were President Roosevelt and Governor Chamberlain, of Oregon. President Roosevelt spoke of the need for conservation of the national resources. He sketched the constitution and work of the Conservation Commission. Three things there were that should be done without delay: first, to provide for a comprehensive plan of waterway development; second, to begin at once on work already planned that would fit into the larger plan; third, to provide amply for forest protection against fire, reckless cutting and wanton or reckless destruction of all kinds, and to secure the Appalachian and White Mountain National Forest. If current revenues did not provide sufficient money to carry out this programme, he favored the issue of bonds for the purpose.

Governor Chamberlain then addressed the meeting, treating especially of waters and waterways and the difficulties in the way of establishing a just and equitable modus vivendi between the national and the state governments for their control.

Section of Mines.

The sessions of the Conference proper began on Wednesday morning, December 8th, in the Red Room of the New Willard Hotel.

The first item of the programme was the reading of the report of the National Conservation Commission. The report of the Section of Mines was then read by Senator Flint. Among the startling statements in the report were the following: the gas now escaping, unhindered, from the oil and gas wells of the United States is sufficient to light all the cities in that country of over 100,000 inhabitants; the known coal fields of the country contain only enough unmined coal to last until the middle of next century; the high-grade iron will last only till the middle of this century; of all the minerals produced in the United States one-sixth is wasted and the loss of life in mining operations is far greater than in any other country in the world.

Addresses were also given by Prof. J. M. Bogert, President of the American Chemical Society; Mr. A. W. Damon, Vice-President of the National Board of Fire Underwriters; Hon. Thos. Walsh, of Washington and Colorado; Governor Johnson, of Minnesota, and Governor Hoke Smith, of Georgia.

Section of Lands.

On Wednesday afternoon the report of the Section of Lands was considered.

The first speech of the afternoon was given by Senator

Knute Nelson, of Minnesota, Chairman of the Section. His speech related almost entirely to the conservation of public lands still under the control of the Federal Government. He sketched the land policy of the Federal Government and the different acts sanctioning disposal of the public lands. In regard to timberlands he favored the Government's retaining them and selling only the mature timber off them. Protection of the privately-owned forests was the duty of the state, and it was within their power to require the destruction of brush.

Governor Noel, of Mississippi, followed. He spoke at length of the problem of stream control, particularly as affecting the Mississippi River. In connection with his own state he reviewed the work of the Federal Government in assisting to build levees and in drainage.

Mr. W. P. Lay presented the report of the Alabama State Conservation Commission, dealing especially with the streams of the state.

Dr. Chas. R. Van Hise, of the University of Wisconsin, as the representative of the Wisconsin Conservation Commission, read the report of that Commission on the subject of lands. It treated particularly of the necessity of phosphates in soils and the loss of these under present conditions.

Mr. J. N. Teal, Chairman of the Oregon State Conservation Commission, then spoke as the representative of that Commission. He suggested making the Conservation Commission a legalized body and putting it on the same plane as any of the other great departments of the Government.

Other speakers of the session were Governor Ansell, of South Carolina; Governor Broward, of Florida; Senator Newlands, of Nevada; Mr. R. H. Richards, President of the American Mining Congress; Governor Blanchard, of Louisiana; G. E. Condra, of Nebraska, representing the Governor of Nebraska; Dr. Rothrock, of the Pennsylvania State Conservation Commission, and others.

Section of Waters.

At the session on Thursday afternoon, December 10th, the report of the Section of Waters was read by Dr. W. J. McGee, Secretary of the Inland Waterways Commission. Dr. McGee emphasized the idea of the water being a resource; the supply of water was not unlimited, there was just so much water and no more. The sole source of water was the rain, and on one-sixth of this (in the last analysis) depended the habitability and the productivity of the country. Each average adult man took into his system, in the course of a year, at least one ton of water, and each bushel of corn required in its making about fifteen to twenty tons of water. The important part of the

water of precipitation was that which seeped into the earth and became ground water. The amount of ground water in the top hundred feet of soil was equivalent to a layer of water sixteen or seventeen feet in depth spread over the entire surface of the country.

Governor Hoggett, of Alaska, gave a brief talk on the resources of that territory, and was followed by Governor-elect Stubbs, of Kansas. The latter emphasized the need of some action and favored the issue of bonds for financing the work.

Addresses were also given by Governor Deneen, of Illinois; Governor Broward, of Florida; Governor Woodruff, of Connecticut; ex-Governor Van Sant, of Minnesota, and Governor Ansell, of South Carolina. Mr. Edward G. Acheson, President of the American Electro-Chemical Society, read a paper and Mr. E. E. Wickley, representing the Farmers' National Congress, made a brief address.

Resolutions were adopted at the session, endorsing the report of the National Conservation Commission and approving the principle of co-operation between the Federal Government and those of the states; urging the adoption of the policy of separate disposal of the surface, mineral and timber rights; favoring the maintenance of Conservation Commissions in every state; urging on Congress the advisability of maintaining a National Conservation Commission and suggesting legislation and action by Federal and State Governments along various lines suggested in the report.

The Conference then adjourned.

The maps shown at the International Conservation Conference at Washington by the Canadian representatives aroused very favorable comment, despatches state a number of these were the work of the draughting department of the Forestry Branch. It is probable these maps will be taken to the general conference at The Hague.

MINNESOTA STATE HORTICULTURAL SOCIETY.

The annual meeting of this Society was held in the First Unitarian Church, Minneapolis, on December 1st to 4th, 1908. The President, Prof. Samuel B. Green, of the State University, was often in the chair, and proved a model Chairman, both in his grasp of the subjects under discussion and in the courteous but firm handling of the time and speakers. Western Canada was represented by Dr. H. M. Speechly, of Pilot Mound, Man., who contributed to the programme an address on 'The Gardening of Perennials in Manitoba." The programme of the meeting was of a very varied nature, including, in addition to forestry topics, papers and discussions on gardening, the culture of fruit trees and bush fruits, beekeeping and landscape work. "Evergreens" was the subject of a question exercise on the first afternoon of the Convention by Mr. Clarence Wedge, of Albert Lea, who had an exhibit of many varieties.

Thursday afternoon was devoted particularly to forestry. The President, Prof. Green, gave an admirable address in which he pointed out the urgent need of careful forestry and the value of the new Forestry School at Itasca Park. Minnesota now has 395,000 acres of State Forest Reserves. The Forestry School at Itasca aims to turning out practical foresters and is equipped after camp fashion with the necessities and not with the luxuries of life. Open air talks often take the place of formal lectures. The students are sent out in fours, each man having his own particular duties.

This address was followed by two excellent addresses, one on "Fire Fighting in our National Forests," by Mr. G. E. Marshall, the other on "Prairie Plantations," by Prof. Wentling. Mr. Marshall spoke on very practical lines, being Supervisor of the Cass Lake Reserve, and stated emphatically that four years' experience of destroying slashings by the modern method showed that the cost instead of being as high as two dollars per thousand feet of lumber was much lower and varied between twelve and twenty-five cents per thousand feet. On the Minnesota Reserves they compel lumbermen to cut the trees to a height corresponding to the diameter at point of cutting. All tops are cleared of brush and made as much use of as possible.

Too little time was given here for discussion, probably because the series of four short talks by Forestry Students, which were excellent in quality, had to be crowded in too. Carl Hamilton read a paper on "Summer Work in Itasca Park;" Clarence French on "Afforestation in the Nebraska Sand Hills;" Raymond Orr on "In a Washington Lumber Camp," and Jas. Gilles on "In a Montana National Forest." Immediately after

the paper on the "Nebraska Sand Hills," Dr. Speechly was able to interpolate the whole of Monsignor Bruchesi's account of Pere Le Febvre's victory over the Oka sands, which was very well received. These students of the State Agriculture College are a fine well-set up bunch of young men, fine representatives of the 800 students in this, the largest Faculty of the State University.

The JOURNAL is indebted to Dr. Speechly for an excellent account of the meeting. This has, owing to the press of other material, had to be condensed.

FORESTRY LEGISLATION IN 1909.

During 1908 New Brunswick made several important changes in her regulations regarding cutting, fire protection, etc., which Lt.-Col. Loggie outlines as follows:—

"The regulations governing the terms and conditions of timber licenses require the licensees to cut down only spruce and pine trees that would make a log 16 feet long and 9 inches at the small end. During the year we have had a number of applications to cut undersized lumber, and where the same has been examined by competent persons and found to be a stunted growth, or thickets, we have given permission to cut below the above standard, but only where the trees would not mature to saw-logs in seventy-five years growth. The thickets are allowed to be thinned out under the supervision of a selected overseer. A great advance has been made in fire protection during the year. We have appointed upwards of one hundred permanent Fire Rangers, with four chief rangers, and these men are in the constant employ of the Government,their duties being to protect the forest from fire, to protect the game, and to see that the fishery regulations are carried out. With reference to settlements on timber lands, the department in every case where persons apply has a report as to the capabilities of the land for farming purposes and acts accordingly. The Government are grappling with the forest problem, and are determined to have such regulations made as will protect the growth of undersized lumber, and the forest from fire. I may say that the work of your Forestry Association has been the means of assisting the Government in this forestry problem."

No changes of importance have been made in the other provinces.

THE NORTH AMERICAN CONSERVATION CONGRESS.

Following upon the National Conservation Conference held in Washington, D.C., in December last, President Roosevelt determined to invite representatives of Canada and Mexico to meet representatives of the United States in a North American Conservation Congress.

The invitation of President Roosevelt was conveyed to Ottawa by Mr. Gifford Pinchot, Chairman of the National Conservation Commission at the end of December last and accepted by the Canadian Government who appointed, as its delegates to the conference, Hon. Sydney Fisher, Minister of Agriculture; Hon. Clifford Sifton, and Dr. H. S. Beland, M.P.

The conference convened in the diplomatic room of the State Department, Washington, D.C., on Thursday, February 18th, and continued in session for two days. Mr. Gifford Pinchot, Forester of the United States, was elected Chairman. Each country represented made a statement as to its own resources, Mr. Pinchot speaking for the United States, Romulo Escobar for Mexico, and Hon. Sydney Fisher for Canada.

Senator Reed Smoot, who was the head of the Section on Forests at the National Conservation Commission, and Dr. W. T. Hornaday, Director of the New York Zoological Garden, were among the other speakers.

On February 26th the report of the Canadian delegates was presented to the House of Commons.

The following are extracts from the report of the Conference:—

The General Principles.

"We recognize the mutual interests of the nations which occupy the Continent of North America and the dependence of the welfare of each upon its natural resources. We agree that the conservation of these resources is indispensable for the continued prosperity of each nation.

"We recognize that the protection of mutual interests related to natural resources by concerted action, without in any way interfering with the authority of each nation within its own sphere, will result in mutual benefits, and tend to draw still closer the bonds of existing good-will, confidence and respect. Natural resources are not confined by the boundary lines that separate nations. We agree that no nation acting alone can adequately conserve them, and we recommend the adoption of concurrent measures for conserving the material foundations of the welfare of all the nations concerned, and for ascertaining their location and extent.

"We recognize as natural resources all materials available for the use of man as means of life and welfare, including those on the surface of the earth, like the soil and the waters; those below the surface, like the minerals; and those above the surface, like the forests. We agree that these resources should be developed, used and conserved for the future in the interests of mankind, whose rights and duties to guard and control the natural sources of life and welfare are inherent, perpetual, and indefeasible. We agree that those resources which are necessaries of life should be regarded as public utilities, that their ownership entails specific duties to the public, and that as far as possible effective measures should be adopted to guard against monopoly.

Use and Management of Forests.

"We recognize that the forests are indispensable to civilization and public welfare. They furnish material for construction and manufacture, and promote the habitability of the earth. We regard the wise use, effective protection, especially from fire, and prompt renewal of the forests on land best adapted to such use, as a public necessity and hence a public duty devolving upon all forest owners alike, whether public, corporate or individual.

Forest Reserves.

"We consider the creation of many and large forest reservations and their permanent maintenance under Government control absolutely essential to the public welfare.

Forest Inventories.

"We favor the early completion of inventories of forest resources, in order to ascertain the available supply and the rate of consumption and reproduction.

Forestry Education.

"We recommend the extension of technical education and practical field instruction in forest conservation, afforestation, and reforestation, so as to provide efficient forest officers whose knowledge will be available for necessary public information on these subjects.

Forest Taxation.

"Believing that excessive taxation on standing timber privately owned is a potent cause of forest destruction by increasing the cost of maintaining growing forests, we agree in the wisdom and justice of separating the taxation of timber land from the taxation of the timber growing upon it, and adjusting

both in such a manner as to encourage forest conservation and forest growing.

Protection of Forests.

"We agree that the ownership of forest lands, either at the headwaters of streams or upon areas better suited for forest growth than for other purposes, entails duties to the public, and that such lands should be protected with equal effectiveness, whether under public or private ownership.

"Forests are necessary to protect the sources of streams, moderate floods, and equalize the flow of waters, temper the climate, and protect the soil; and we agree that all forests necessary for these purposes should be amply safeguarded. We affirm the absolute need of holding for forests or reforesting, all lands supplying the headwaters of streams, and we therefore favor the control or acquisition of such lands for the public.

Inducements to Reforestation.

"The private owners of lands unsuited to agriculture, once forested and now impoverished, or denuded, should be encouraged by practical instruction, adjustment of taxation, and in other proper ways, to undertake the reforesting thereof.

Forest Fires.

"Notwithstanding an increasing public interest in forestry, the calamitous and far-reaching destruction of forests by fire still continues, and demands immediate and decisive action. We believe that systems of fire guardianship and patrol afford the best means of dealing adequately with fires which occur, whether from natural causes, such as lightning, or in other ways; but we affirm that in addition thereto effective laws are urgently needed to reduce the vast damage from preventable causes.

Regulating Cutting.

"Apart from fire, the principal cause of forest destruction is unwise and improvident cutting, which, in many cases has resulted in widespread injury to the climate and the streams. It is therefore of the first importance that all lumbering operations should be carried on under a system of rigid regulation.

Forests on Watersheds.

"The first requisite for forest or other covering which will conserve the rainfall and promote regularity of water flow is the retention of the soil upon watersheds. We therefore favor the construction of such artificial works as may effect this

purpose and the encouragement thereof by remission of taxes, Government co-operation, or other suitable means.

GAME PROTECTION.

"We recognize that game preservation and the protection of bird life are intimately associated with the conservation of natural resources. We therefore favor game protection under regulation, the creation of extensive game preserves, and special protection for such birds as are useful to agriculture.

CONSERVATION COMMISSIONS.

"The action of the President of the United States in calling this first conference to consider the conservation of the natural resources of North America was in the highest degree opportune, and the proceedings which have followed, and the information mutually communicated by the representatives assembled, have, we believe, been conducive to the best interests of the countries participating. To derive the greatest possible benefit from the work which has already been done, and to provide proper and effective machinery for future work, there should be established in each country a permanent Conservation Commission.

EXCHANGE OF INFORMATION.

"When such conservation commissions have been established, a system of inter-communication should be inaugurated, whereby, at stated intervals, all discoveries, inventions, processes, inventories of natural resources, information of a new and specially important character, and seeds, seedlings, new or improved varieties, and other productions which are of value in conserving or improving any natural resource, shall be transmitted by each commission to all of the others, to the end that they may be adopted and utilized as widely as possible.

WORLD-WIDE CONSERVATION.

"The conference of delegates, representatives of the United States, Mexico, Canada and Newfoundland, having exchanged views and considered the information supplied from the respective countries, is convinced of the importance of the movement for the conservation of natural resources on the Continent of North America, and believes that it is of such a nature and of such general importance that it should become world-wide in its scope, and therefore suggests to the President of the United States of America that all nations should be invited to join together in conference on the subject of world resources and their inventory, conservation and wise utilization."

Signed: Gifford Pinchot, Sydney Fisher, Clifford Sifton, Robert Bacon, Romulo Escobar, Migual A. de Quevedo, Henri S. Beland, James Rudolph Garfield, Carlos Sellerier, E. H. Outerbridge.

UNITED STATES TARIFF ON PULP AND PAPER.

The committee of the United States House of Representatives which has for months had under investigation the question of the duty on pulpwood and paper, reported to the House on Friday, February 19th. As a result of their investigations they recommend that mechanically ground pulp wood be admitted free of duty "from any country, dependency, province or other subdivision of government which does not forbid or restrict the exportation of or impose any export duty, export license fee or other export charge of any kind whatsoever, either directly or indirectly" upon ground wood or pulpwood; in all other cases they recommend that the duty be one-twelfth of one cent per pound. They further recommend that the duty on chemical wood pulp, unbleached, be one-sixth of one cent per pound dry weight, and on the bleached pulp one-fourth of one cent per pound, dry weight. If any country charge an export duty on pulpwood, the amount of such charge is recommended to be added to the other duties. Print paper, valued at not more than two and a quarter cents per pound, is recommended to be taxed one-tenth of a cent per pound, and paper worth from two and a quarter to two and a half cents per pound, four tenths of one cent per pound. The present tariff is three-tenths of a cent per pound on paper valued at two cents per pound or less, and four-tenths of a cent per pound on paper worth from two to two and a half cents per pound. "This, in the main," say the committee, "is a reduction in the tariff on ordinary newsprint paper from $6 a ton to $2 a ton." Further investigations by the Bureau of Plant Industry to procure some plant which will yield a fibre suitable to substitute for spruce in the manufacture of paper and by the Forest Service in their endeavor to find woods which can be used in the manufacture of wood are urged.

Mr. Norman M. Ross, Chief of the tree-planting division of the Forestry Branch, represented the forestry interests at the recent meeting of the Western Horticultural Society, giving an address, illustrated with stereopticon views, of the work done at the nursery station at Indian Head.

NOTES.

WISCONSIN'S 1908 FIRE LOSS. "This year the forest fires in Wisconsin have burned over 1,200,000 acres of land, and have caused $9,000,000 worth of damage," said State Forester E. M. Griffith, of Wisconsin, recently. "This large loss is due primarily to the burning of large tops and limbs, called slash, left in logging operations."

PROPOSED WISCONSIN LEGISLATION. The Wisconsin Legislature will this year have before it some legislation of great importance in regard to the disposal of brush. The legislation is being asked for by lumbermen themselves, organized as the "Wisconsin Timberland Owners' Association," and there is every reason to hope that their requests will be acceded to. Some of the legislation asked for, as embodied in a resolution of the body named above, is as follows:—

Sec. 1. Any person who shall cut, or cause to be cut, any logs, bolts, pulp wood, ties, poles, posts, or other forest products, in any of the counties designated in Section 4 of this Act, shall pile the tops and refuse as the cutting proceeds, and shall, within one year from such cutting and felling, burn all such piles of refuse and tops, and in such burning all reasonable care shall be taken not to damage standing timber or adjoining property. The term "burning" shall be construed to mean the destruction by fire of so much of such slashings as would become easily combustible material and dangerous in event they were not so destroyed, but no burning shall be done during dangerously dry weather.

Sec. 2. Any person who violates any of the provisions in regard to the burning of slashings, refuse, etc., shall be guilty of a misdemeanor and shall, on conviction therefore, be punished by a fine of not less than fifty (50) cents, nor more than two dollars ($2.00) per thousand feet, log scale for all timber; not less than twenty-five (25) cents, nor more than one dollar ($1.00) per cord for all bolts, pulpwood, cord wood or bark; and not less than ten (10) per cent. nor more than fifty (50) per cent. of the full cash value of other forest products cut and removed from such land.

Sec. 3. In case any person fails to properly pile and burn the tops and refuse, the state board of forestry may, in its discretion, cause the same to be done, and the expense thereof shall be a lien on the timber or other forest product cut from the land on which the tops and refuse are situated or cut, and

shall also be a lien upon the land itself. Proceedings for the enforcement of such lien shall be instituted by the district attorney of the country in which the cutting was done, at the request of the state board of forestry and in the name of the State of Wisconsin as claimant; and costs shall be recovered in the usual manner. The claim for any lien shall be filed by the state fire warden, or under his direction by any of his assistants, inspectors, assistant inspectors, patrol or fire wardens, in the district in which the expense occurred, in the office of the clerk of the district court, in the county in which the claim arose.

The State Forest Fire Warden is to be given power to modify the provisions of the Act in individual cases, where he considers it advisable.

LUMBERMEN VALUE FORESTERS' WORK.

As was noted in the issue of the JOURNAL for October last (p. 122), Messrs. White, Mitchell and Dwight, of the senior class in forestry in the University of Toronto, spent the summer vacation in forest work on the limits of the Turner Lumber Company. The character of the work done and the value which the company places on it is well shown by the following letter recently received by Dean Fernow, of the Faculty of Forestry:—

Dr. Fernow,
Dean, Faculty of Forestry,
University of Toronto,
Toronto, Ont.

Dear Sir:—

We have received a topographical map of lots 1 to 12, concessions 5 to 9, of the township of Wilson, which was made by students of your department after they had made an examination of the territory. This map shows accurately the character of the country, the location of roads, streams and lakes, and also the timber, with the kind designated.

We do not believe that we could hire a timber cruiser or an engineer in Canada who could get up a map as valuable to us for the purpose for which it will be used.

We sincerely hope that next summer you will be able to recommend to us students from your department who can do similar work for us on this township and others, as we are anxious to have all our holdings examined and maps made of them in the same accurate and intelligent manner as the work performed by Messrs. White, Dwight and Mitchell.

Yours truly,
(SGD.) DWIGHT J. TURNER,
President.

TIMBER IN NEW SOUTH WALES. According to the recently published report of the Royal Commission appointed to inquire into the timber resources of New South Wales, the total quantity of commercial timber at present standing in the state, excluding timber growing on private lands, is estimated at 23,116,000,000 superficial feet, consisting of: Hardwoods: ironbark, 1,355,000,000 superficial feet; other hardwoods for milling, 8,668,000,000 superficial feet; for other purposes, 11,788,000,000 superficial feet; total, 21,811,000,000 superficial feet. Softwoods: cedar, 5,000,000 superficial feet; hoop pine, 230,000,000 superficial feet; other brushwoods, 150,000,000 superficial feet; cypress pine, 920,000,000 superficial feet; total, 1,305,000,000 superficial feet.

The commissioners state that, at the present rate of consumption, the quantity of hardwood timber suitable for commercial purposes, estimated to be at present standing on the forest reserves and other Crown lands of the state, will not last more than about thirty-six years, and that the supply of softwoods will be consumed in a little more than twenty years. Amongst other things the commissioners recommend that the present royalites on certain timber should be increased, and that the export of ironbark and tallowwood beyond the Commonwealth should be prohibited for a period of ten years. Recommendations are also made for the replanting of the most valuable timbers and for the protection of timbers at present standing.

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