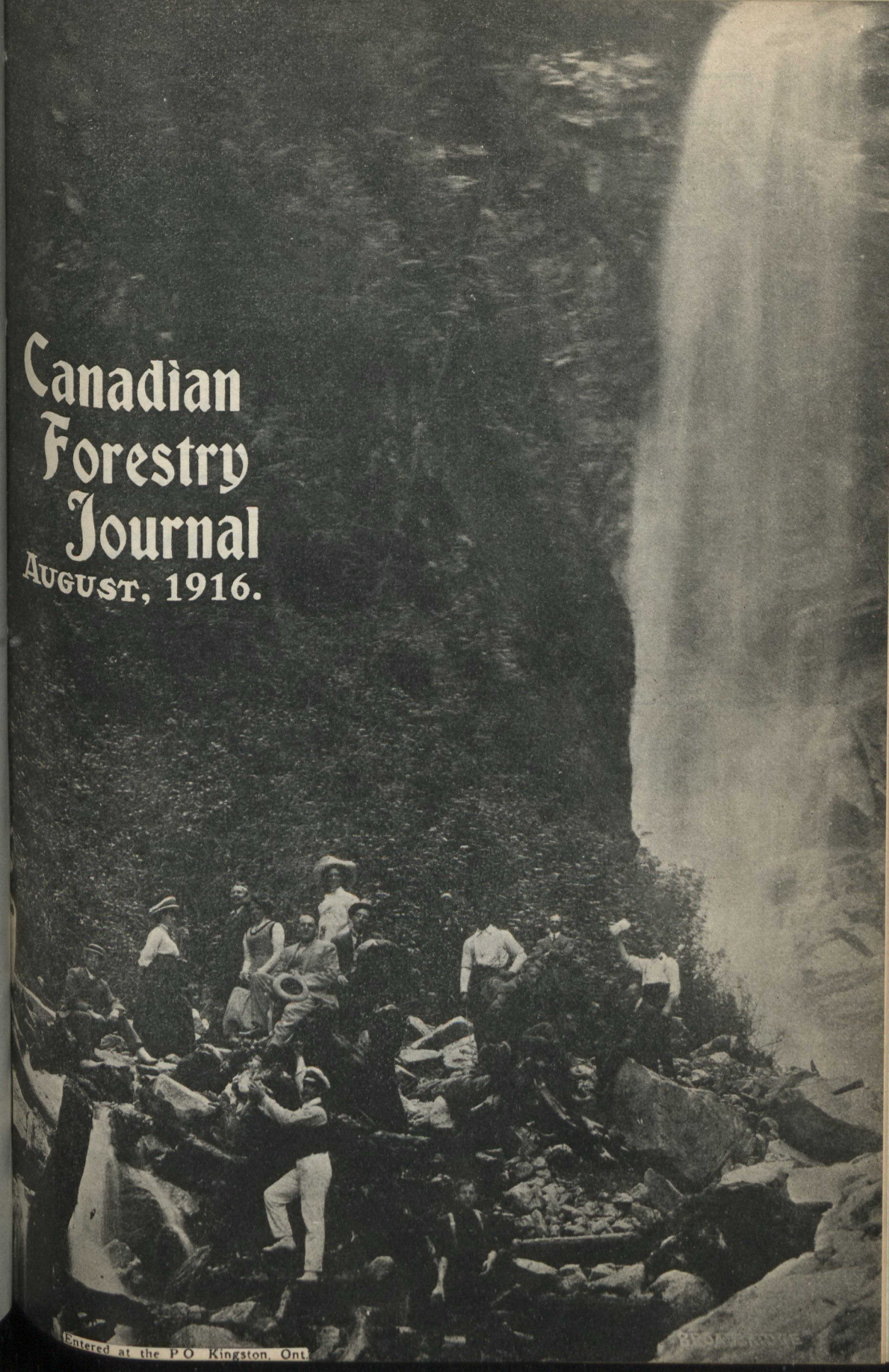
Canadian Forestry Journal

AUGUST, 1916.



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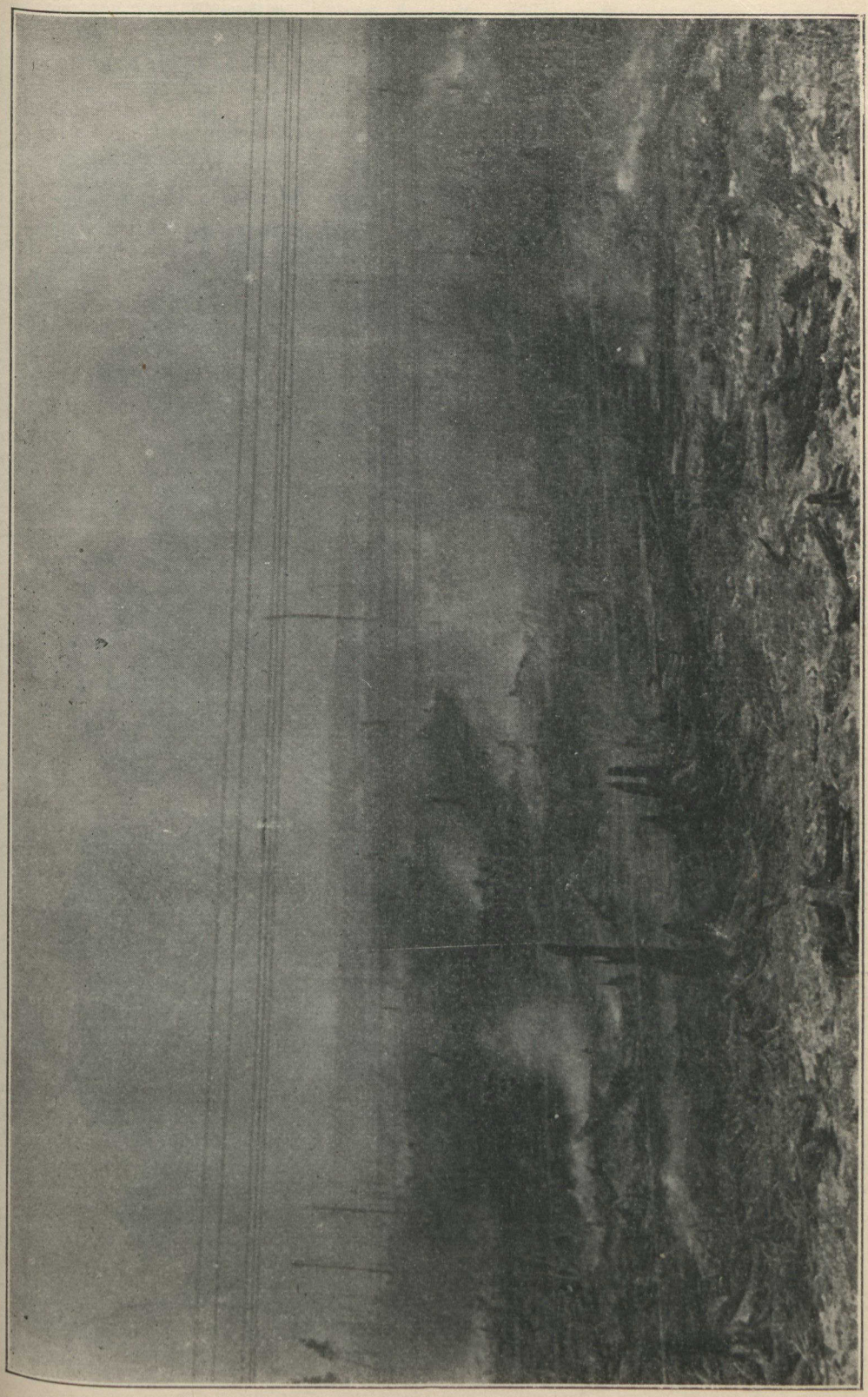
AFTER THE FIRE HAD CLEANED OUT MATHESON.

Emergency shelters in which the remainder of the population lived. Coffins and boxes for some of the 135 bodies buried in Matheson's new cemetery may be seen.

GROUPS OF REFUGEES ABOUT ENGLEHART STATION.

Most of the settlers is the devastated districts will return to their homesteads, and, with Government aid, make a fresh start.



THE SCENE OF THE MOST DISASTROUS FOREST FIRE IN THE HISTORY OF CANADA. LOOKING OUT FROM MATHESON.

The Searchlight on Ontario

A Frank Analysis of a Forest Protection System Maintained on an Outworn Model, With Suggestions for its Reformation

By Robson Black, Secretary, The Canadian Forestry Association, Ottawa.

In the face of the appalling forest fire tragedy in Northern Ontario, press and public are inquiring diligently as to the causes of forest fires, the methods of fire prevention, and are asking very frankly if the Provincial Government can entirely shake off responsibility for the heavy harvest of death and destruction.

The sacrifice of timber wealth, of entire towns, of maturing crops, has been a severe blow, particularly at a time when the guarding and developing of national wealth are accepted as keys to victory in the World War, but the conscience of the public has been far more deeply affected by the sacrifice of unreplacable lives.

The time to block forest conflagrations is, paradoxically, before they commence. Well-organized forest protection systems in British Columbia, Nova Scotia and sections of Quebec, as well as in the United States and Europe, have demonstrated the comparative ease of preventing fires from starting. After the fire is well under way, the same carefully organized systems can usually succeed in isolating the flames and greatly reducing the damage. Success in preventing and in fighting forest fires pre-supposes a condition of affairs to which the Ontario Department of Lands and Forests is yet a stranger. Nothing but a radical overhauling of the forest service of the province can give the people any assurance that 1917 will not witness a catastrophe even more violent.

In the first place, the forest service of Ontario is built on a very old model. While spending $300,000 a year on "protection" not more than a portion of that sum is represented in "value received."

The patrol of areas such as the "Claybelt" makes no pretense at thoroughness; educational work in fire prevention has been very slight, and the flimsiest provision made against such fearful onslaughts of flames as have now taken their ghastly toll.

Ontario, outside the Reserves, possesses very little equipment as telephone lines, trails, highways, lookout towers and cabins, such as are absolutely essential to any effective system of defence against fire.

Real "Rights" of Settlers.

One particular point of deficiency, emphasized by the recent fires, is in the ability to control settlers' burning operations. Quebec, British Columbia and Nova Scotia empower their fire guardians to penalize a settler who starts a clearing fire without written permission from a qualified ranger. In dry hot spells fires of all kinds may be absolutely prohibited in prescribed areas, and at all times, even of comparative safety, slash is piled properly or fire lines cut around the clearing. On-

tario takes no such precautions, although representations to that effect have been energetically made to the Government year after year. The settler is allowed to burn precisely as carelessness or ignorance may dictate and annual holocausts will remain possible until that "liberty" is sensibly curtailed.

The settlers going into Northern Ontario have a perfect right to demand that their lives and property shall be guarded by the Government to the best of its power. The recent fires doubtless helped to clear some land for agriculture, but for every acre so assisted, probably four or five acres of non-agricultural tree-growing land were affected disastrously. Certainly the danger of future fires has increased, as the areas of fire-killed timber widen, so that in a year or two, a mass of windfallen debris will present a perfect target for fresh conflagrations. If forest protection was needed early in 1916, to **prevent** the tragedy that has now occurred, it will be needed vastly more to offset a recurrence on a far worse scale in years to come.

If evidence were needed that the forest protection system of Ontario requires a far-reaching and determined overhauling, that evidence will be found in a perusal of the 1915 report of the Ontario Department of Lands, Forests, and Mines. Both by what the report states and by what it neglects to state, may be judged the wisdom of the Canadian Forestry Association's efforts to cause a re-organization of the Ontario ranger service, and place forest guarding among the creditable performances of the provincial government.

Two or three facts stand forth clearly: Neither the Ontario Government, the wood-using industries, nor the general public have more than a remote knowledge of the annual losses from forest fires. Only in patches of the forested area, mostly along the railways, is any consistent effort made to more than note the **number** of fires. The character of the timber destroyed, its acreage, etc., are immeasurably the most important features and under the present system are not reported on by the rangers and supervisors in anything even approaching an adequate way.

Why This Difference?

The Ontario limit holders are paying for their fire ranging considerably more than twice as much per acre as the limit holders included in the St. Maurice or Lower Ottawa Protective Associations of Quebec, although the protection afforded the latter is superior.

It is a well-established fact that railways, taken as a whole, are no longer the main source of timber losses throughout the Dominion. This is, to a very large extent, directly due to the increased efficiency of the railway fire protective organization, working under the regulations of the Railway Commission. These regulations impose stringent requirements in the direction of fire protective appliances on locomotives, control of right-of-way clearing operations, patrol of forest sections, action by all regular railway employees in reporting and extinguishing fires, etc. As a result of all this, both the number of fires caused by locomotives and employees and the amount of property destroyed is decreasing rapidly.

Having regard to these facts, note the representations of the Ontario Department of Lands and Forests, which should be an accurate and complete mirror of forest losses and their causes during the year under consideration, 1915.

Out of a total of 430 fires of all kinds, reported to the Department by its own patrolmen and rangers in 1915, 317 fires were reported by rangers patrolling just two railways

—both government-owned and operated—the Transcontinental and the T. and N. O.

The Private Owned Lines.

What about the record of the four other railways—non-Government-owned—in Ontario? The patrolmen on these lines are appointed direct by the companies, subject to the regulations of the Board of Railway Commissioners of Canada. A total of 110 fires was ascribed to the **railway zone** of the C. P. R., C. N. R., G. T. R. and Algoma Central, but only 59 of these were of "known railway causes," doing a total damage of $4,156.25.

With our attention focused upon the foregoing piece of information, that on the four company-owned railways in Ontario fires from "known railway causes" accounted for damage amounting to $4,156.25, and being anxious to learn the origin of the really serious timber losses sufficient by Ontario in an average year, we peruse the department's declaration that **57 per cent of all fires in Ontario forest lands in 1915 were reported by rangers patrolling the Government-owned railway lines.**

The year 1915 was, of course, a period of comparatively small damage by forest fires. Then what of 1914, a **bad fire year?** The Ontario Department of Lands and Forests declared that 95 per cent of all fires known to the Department were reported by rangers patrolling railway lines, though only 30 of these caused damage to timber.

A False Impression.

The impression given to the reader by these annual reports is wholly inaccurate. He would assume, naturally, that the railways were indulging in a carnival of destruction, whereas, by the Department's own figures, the "known railway fires" of four of the six railways, did a little over $4.000 damage to Ontario forest growth in 1915.

Resolving into the plainest possible form all the information received in 1915 in regard to Ontario's forest guarding we learn that:

One hundred and twenty-nine men, employed by the province to patrol the Transcontinental and the Temiskaming and Northern Ontario railways reported 317 fires, while the C. P. R., G. T. R., C. N. R. and Algoma Central reported through the twelve government inspectors 110 fires.

One hundred and sixty-six men on Ontario's forest reserves reported 52 fires.

One hundred and seven men on unlicensed Crown lands reported 61 fires.

Two hundred and eighty-six men ranging the Crown lands under license reported 56 fires, "37 doing no damage."

On the face of this showing, 559 rangers, working in districts back from the railways managed to report about half as many fires as 129 rangers working along **two** public-owned railway lines.

These figures, undoubtedly, are not capable of disclosing more than a confused fraction of the actual story.

Who will credit for a moment that 95 per cent of the forest fires in Ontario in 1914 originated within the railway zones? or that 286 men **diligently** patrolling 10,000,000 acres in 1915 could discover only 19 fires causing damage? or that 107 men can give even the shadow of real protection to 50.000,000 acres of unlicensed Crown Lands containing more or less merchantable timber?

A Few Explanations.

How, then, are these puzzling pieces of information to be accepted?

One obvious explanation of the high percentage of timber losses **ascribed** to the railway zones is that railway patrol is intensive and fairly well supervised. On the Trans-

continental and Temiskaming and Northern Ontario lines (Government owned) the rangers are paid by the province and are hence under closer control.

The meagre information concerning losses on unlicensed lands is the reasonable product of a small staff of rangers, plus poor supervision.

The failure of the Government statistics from licensed lands to uncover more than a small part of the annual fire record proceeds from the fact that rangers on the berths are not paid by the province but by the licensees and therefore not subject to the same degree of control. In addition, the supervision of these men is such as, applied to a modern manufacturing plant, would breed laxness and waste at every turn.

Perhaps the most important of all explanations is that Ontario is the only province owning a large area of Crown Lands which does not require all rangers to submit individual reports of each fire on special forms. The Department depends upon the vague, happy-go-lucky and incomplete entries in the rangers' diaries which are not turned in until the end of the season. The rangers' diaries pay little attention to the really important information connected with forest fires—the extent and character of destroyed areas. This system may give the Department some knowledge of the **numbers** of timber fiires, but is an entirely unreliable index of the annual loss.

The Timber Berths.

The reader will not require more argument than a reproduction of the Department's own statements to recognize a very pronounced lack of business efficiency on the timber lands under license. **Eight supervisors only were made responsible for the inspection of 286 men.** The meagreness of this managing force is a bid for poor discipline. Ontario has about 10,000,000 acres under license by lumber and pulp companies. The cost of patrol and fire fighting is borne entirely by the licensees. The salaries of the eight supervisors appointed by the Government, are also paid ultimately by the licensees. This 10,000,000 acres represents, obviously, the most accessible and valuable timber remaining to the province. Yet in providing protection against fire, the Government, as trustee, requires the eight supervisors to assume the direction of an average of 36 men each. The Ontario Government in the Missisaga Forest Reserve gives four supervising officers to 40 rangers and this ratio of one officer to ten men is the least that can be done without throwing efficiency to the winds. Eight supervisors cannot get the maximum service from 286 men over such an immense territory as 10,000,000 acres, and the best proof of this statement is the annual report of the Department of Lands and Forests.

Is 300,000 Adequate?

Ontario spends over $300,000 annually for forest patrol, including expenditures by the province and by limit-holders. Is this adequate?

The inadequacy is not in the amount expended, but in the thing it buys. Money can be wasted with as much facility in a forest as in a town. Ontario is not getting, by any means, all that it is paying for in the way of forest fire protection.

The best protected forest area in Eastern Canada is probably the 24,000 square miles in Quebec under the care of the St. Maurice and the Lower Ottawa Forest Protective Associations. These were organized by limit holders on business lines, with competent managers, and a plan whereby one inspector is assigned to about ten men.

Their patrol, including time and money spent on building lookout towers, trails, camp fire places, repairing telephone lines, etc., costs

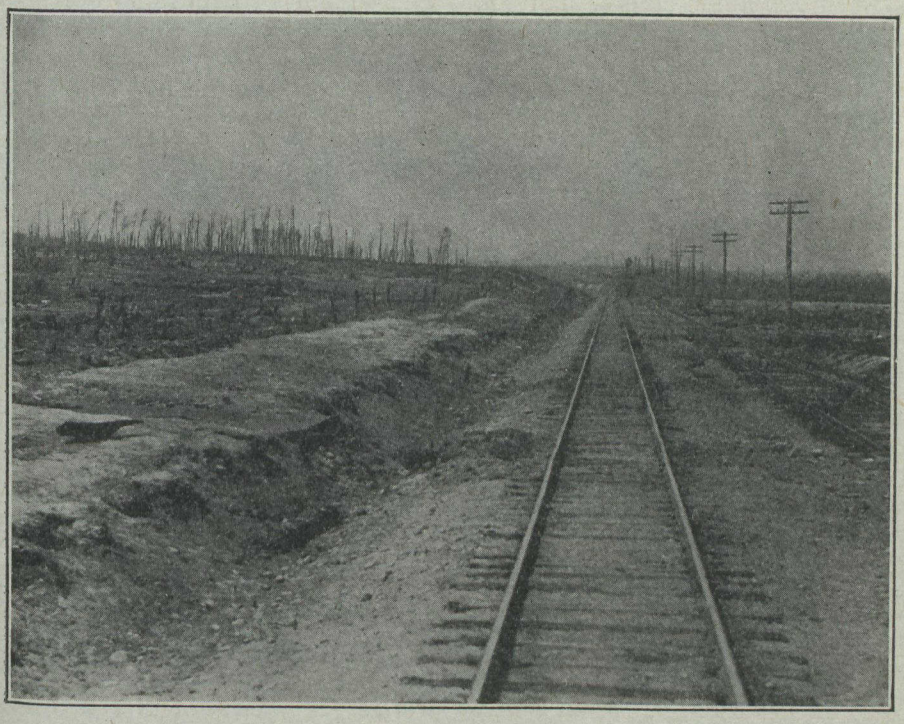
about a quarter of a cent per acre per year. Relatively speaking, the results are excellent, and justify a much heavier expenditure for a correspondingly more complete fire protection service. With the expenditure per acre incurred in Ontario, practically complete protection from fire can be secured.

At a quarter of a cent per acre, the entire 10,000,000 acres said to be under license in Ontario could be patrolled for $25,000 and patrolled about as thoroughly as the lands of the private associations in Quebec. The Ontario licensees now pay $70,000 annually for a protective service that, frankly speaking, **is not in the same class.** The Quebec associations are far from full-grown, but they avoid at least the costly overlapping incident to the "every man for himself" plan to which the Ontario licensees are bound. Some of the Ontario licensees pay as high as $5 per square mile for fire patrol per year. The highest assessment yet made against the members of the St. Maurice Forest Protective Association in Quebec is $1.92 per square mile, but that low rate is obtained by unification of ranger control, the mapping of patrol districts on economical and proper lines, and improved methods of communication and transportation, through the construction of trails, telephone lines and loookut stations. In Ontario, however, every licensee shifts for himself. Co-ordination of patrol service is practically unknown, and the limit holder pays dearly for a small degree of protection, or sometimes fails to get it at all on account of the fire ranger being used primarily for other work. Apparently only in the parks and in some of the reserves has even a small beginning been made in the construction of trails, telephone lines and lookout stations. And yet this mechanical foundation is absolutely essential to any well-organized forest fire protection service. Surely the interests of the wood-using industries of present and future demand that the Ontario Government **organize** the licensed lands for patrol purposes. It does not seem an exaggeration t predict that if such action were taken, the amount of protection to the best timber in the province would be quadrupled, without a penny of additional cost to either licensee or taxpayer.

On Unlicensed Lands.

The situation on unlicensed lands is far worse than on licensed lands. The Dominion Forestry Branch estimates that Ontario has 70 million acres of land, containing more or less merchantable timber, in addition to a very large area which is relatively non-productive on account of muskeg, repeated fires, climatic conditions, etc. Of this probably about 20 million acres are included in forest reserves, parks and timber limits, leaving something like 50 million acres of unlicensed Crown timber land not included in parks and reserves, and exclusive of non-productive areas such as muskegs, lakes, areas repeatedly burned, and lands too far north to produce timber of commercial value. On this vast area, there is a very large amount of merchantable timber, largely pulpwood, which has not been placed under license on account of relative inaccessibility to transportation or for other reasons. Enormous quantities of timber have been destroyed by fire, and great areas have been rendered unproductive by the great conflagrations which have swept over them time after time.

Each year, lands under license are surrendered by the limit-holders, usually because the timber has been cut out. In other cases, the area under license is reduced because of failure of the limit-holder to pay ground rent or stumpage dues. To a certain extent, these losses are made up by the issuance of licenses



Looking toward the railway cut at Nushka, where on Saturday, July 29th, fifty-four men, women, and children attempted to take refuge and were smothered and burned to death.

covering new areas. However, for years past, there has been a steady decrease in the total area of Crown lands held under license. The reports of the Department of Lands, Forests and Mines show, for instance, that in 1912 there was a net decrease of 996 square miles from the total area under license in 1911. The reduction in 1913 was 891 square miles and in 1914, 184 square miles. In 1915, the reduction was 1621 square miles.

The rapidity with which cut-over lands in Ontario are being surrendered to the Crown is shown by the statement of the Department that 307 square miles were surrendered, as cut out, in 1912. In 1913, 1914 and 1915, the areas so surrendered were 257, 1,111 and 602 square miles respectively. New licenses were issued in 1913, 1914 and 1915 covering 100, 500 and 312 square miles respectively.

A Losing Deal.

It is perfectly obvious that unless the burned-over and cut-over lands, including those surrendered by license holders, are allowed to restock naturally, so that they can in the course of time be cut over again, the lands fit for cutting and of reasonable accessibility will ultimately become exhausted or approximately so. When the pinch begins to be felt, to the extent that new areas of merchantable timber, of suitable accessibility to transportation, can not be located for the issuance of new licenses, there will be an increasing tendency toward the reduction of the forest revenue of the province. During the past ten years, these revenues, which go into the provincial treasury and relieve direct taxation to that extent, have averaged

between a million and a half and two million dollars annually. During 1903, 1904 and 1905, due to the extensive sale of new timber limits, they ran well over two million dollars annually. Since Confederation, in 1867, and up to October 31, 1915, the total revenue which the provincial treasury received from Crown timber has been upwards of $52,850,000, an average for 48 years of more than $1,100,000 annually.

In order to hold up provincial timber revenues, it is essential that new areas of timber suitable for cutting be constantly available, to replace areas surrendered as cut out. To safeguard this situation, it is absolutely essential that there be an adequate system of fire protection on unlicensed Crown Lands as well as on those under license. Any other policy will mean an ultimate decrease in the provincial timber revenues, as well as shortage of supplies for the many hundreds of wood-using industries in the province.

Yet, notwithstanding the above, we find, according to the report of the Department for 1915, that only 107 fire rangers (paid by the province) were assigned to the protection of the 50 million acres of unlicensed and unreserved Crown Lands containing merchantable timber, as compared with 286 men (paid by the licensees) for the protection of the 10 million acres of land under license. That it is impossible for this relatively small body of men to afford even partial protection on more than a small percentage of such a vast area goes without saying.

Thorough-going Action.

The situation in Ontario calls urgently for a complete reorganization of the whole fire-ranging system along modern and up-to-date lines, with adequate attention to the protection of unlicensed Crown lands as well as forest reserves and parks and lands under license. The Department of Lands and Forests of Ontario is entitled to the credit of having been the first governmental agency in Canada to recognize the necessity for an organized system of forest fire protection. In 1885, a beginning was made in the organization of a fire-ranging service on licensed lands, and in succeeding years this organization has been developed and extended. However, on the whole, the organization has not kept pace with modern developmnts in some of the other sections of Canada or in the United States. The lack is very largely one of organization and supervision, both in the head office and in the field. The amount of money now being expended is sufficient, if handled according to modern business standards of organization, to provide a very much better degree of fire protection than is now secured. H. R. MacMillan, Chief Forester of British Columbia, has stated that more money is wasted in fire protection today than is used economically, because of lack of field supervision. The fire protection situation in Ontario is an illustration of this undeniable fact.

Holders of Burning Permits Liable

In the State of Washington the holding of a burning permit does not relieve responsibility in case the fire spreads beyond control and endangers the property of others. On June 13, Culliton Brothers who are constructing three miles of the Scenic Boulevard near Everett, lost control of a slashing fire which destroyed a 600-foot logging chute belonging to the Haybrook Lumber Co. The county commissioners and engineer have decided to withhold $1,714.04 from the contract price of the road. An amicable understanding was reached by the fire warden, state officials and Culliton Brothers at a meeting in Everett on June 23. Settlement was made without expense to the state.

New Brunswick's Business Plan of Land Classification

An Interview with Mr. F. C. Nunnick, Agriculturist of Conservation Commission Guiding the Settler

The wisdom of classifying the lands of a Province and utilizing them according to the plan of Nature would seem self-evident. Only in very recent times, however, have matter serious attention, and even now the idea has not been adopted as an invariable policy. The lapses and incongruities are to be seen on every hand, playing false to the public good, and burdening the state with pitiful and costly problems in present and future.

New Brunswick, however, has made an excellent start at surveying the provincial domain, and learning the soil possibilities of section by section, as well as compiling a record of the timber resources. The Government of New Brunswick recently received the aid of Mr. F. C. Nunnick, Agriculturist of the Commission of Conservation, for several weeks field work, in order to advise the government as to methods of procedure in land classification. Following is an interview with Mr. Nunnick, given to the Forestry Journal:

Quality of Soils.

"We visited only a small area in the short time at our disposal. The foresters in connection with the Forest Survey, however, will continue to do what they can in connection with land classification. In order to make a thorough classification of soils, a soil man should accompany each party to see for himself the types and quality of soil and laboratory tests should be made of samples of the various types. Of course, much can be done by the foresters who obtained some information from us, as they accompanied us on our trips. We made out a circular of instruction to be given each party regarding the classifying of soils, taking of samples, etc. We began our work at Weaver's, a small station on the I. C. R., not far from Doaktown, and found here a very poor agricultural soil, some of the settlers having been on this land from twenty-five to thirty years and only having small clearances made in that length of time. These men work in the woods in the winter time and part of the summer and simply use the land to grow a few potatoes and feed for their team and the few cows which they keep. These men stated that the land produces poorly and that the production has decreased since they first began cropping it. The method of farming conducted by these men—that is, with so little live stock—is not conducive to permanent soil fertility. Much of the soil we visited on our various trips is hungry, and if used for agriculture, would need to be fed right from the start, that is, clover crops ploughed down or farm-yard manure should be applied. We found also that where farming is being done and has been carried on for many years that the crops best suited to the land are not being grown. Much of the soil needs liming, and just here I would like to suggest the advisability of illustration work of this kind being carried on in the new districts as

well as in the old. In the older districts illustrations in connection with soil renovation should be conducted, while in the new districts, tests should be made to ascertain what the land is best suited for and what crops it will grow most profitably.

Would Bar Settlement.

"Some of the land we visited is absolutely unfit for agricultural purposes and should never be opened for settlement. As an example of this, the land behind the row of lots granted on the Miramichi river, south of Doaktown as far back as Cains river, is a light sand. The duff or leaf mould is thin, being in most instances only two or three inches in thickness underlaid by several inches of white or gray sand underneath, which is brown sand which runs down considerably below plough depth. This is suited for forest growth only and should never be broken up for any other crop. In other sections, we found a fairly good agricultural soil, and in some sections, a very good agricultural soil. In the Pleasant Ridge settlement, north of Boisetown, we found a fair agricultural soil. It needs good management, however, and intelligent treatment. South of Boisetown again, after leaving the granted land and on back to Cains river, we found the gray and brown sand again constituting a soil unsuitable for agriculture. On one hike out from camp No. 1, which was situated on Halesbrook, we went in a south and southwesterly direction for a distance of six or seven miles and found good agricultural soil. I am merely citing these as examples to show you that in some places there exists soil unsuitable for agriculture, and in other places, land which could well be used for farming purposes. We also found another condition which it might be well to mention—that is, of small, isolated valleys which might contain fair or very good soil, but the restricted areas and the difficulty encountered in reaching these small areas makes the wisdom of opening them very doubtful, indeed. Again, we found some areas where there has been fire and where the soil is only fair and where no profit can come from the forests for many years. The opening of these areas for agricultural purposes is debatable, as the land sometimes is of an indifferent quality and it would depend, I imagine, on how urgent is the need for farm land.

Needed Everywhere.

"I am convinced that the need for land classification ahead of settlement is very great and that it would be greatly in the interests of the settlers if such could be carried on everywhere in Canada where land is being opened for settlement.

"In some places we also found the soil so filled with rocks and boulder stones that a man and his children would be gray-haired before they could all be cleaned out in order that the land might be easily tilled. In fact, I heard one man make the statement that he had so many stones on his farm that he found it necessary to rent land from a neighbour on which to pile them. There are many problems that the settlers have to contend with which an outsider can scarcely fully appreciate, but you cannot emphasize too strongly the advisability of an examination of the land before it is allowed open for settlement. After having spent some weeks on this work, I am more firmly convinced of this than ever.

Fire Damage.

"I might just remark in passing that on one large burned-over area adjoining Cains river, about thirteen miles south of Doaktown, the duff had practically been all burned off and the white or gray sand was showing over the whole area. The second growth of pine (red, white and Jack pine) was making a very good growth, but it stands to reason

that where some of the duff is left or has not been burned off, it would very much assist in holding moisture during the dry season of the year, which would assist materially in the more rapid growth of the young trees. Wherever I had the opportunity to talk with settlers who were clearing land, I strongly advised them to do their burning carefully and to burn as little of the duff as possible, because when breaking, the mixing of the duff or leaf mould with the under-soil adds humus, which is necessary to make a soil productive. If the burning can be done in the spring while the duff is wet and the slash dry enough to burn, it would seem the wiser plan."

The Man Who Named the Douglas Fir

Adventurous Life and Terrible Death of David Douglas; Introduced 217 Plants to English Gardens

Douglas was the family name of Lord Selkirk, founder of the Red River Settlement, and it was the name of other men who have been prominent in Western Canada, so that considerable doubt exists in the popular mind as to the particular man after whom the famous Douglas fir was named. It is found that it was not named after a founder, governor, or chief justcie, but after a remarkable man in a humbler sphere of life. It should also be noted, too, that while the name of Douglas will always be associated with the common name of this magnificent tree, yet the scientific name fails to show any connection. It is called scientifically Pseudotsuga, literally, false hemlock. It is not false hemlock. It is a much finer tree than any hemlock, and it is to be hoped that a later generation of botanists will change the name and give Douglas a place in it.

Regarding Douglas, Dr. Charles S. Sargent, Director of Arnold Arboretum at Harvard University, has this to say of him in a footnote in his famous work "Silva of North America":—

"David Douglas (1798-1834) a Scotch gardener sent by the Horticultural Society of London to explore the forests of the Northwest Territory, is, from his courage, energy and success in the presence of great difficulties and dangers, and from his untimely and horrible death, a conspicuous figure in the annals of American botanical exploration. Douglas, who had been trained by Sir William Hooker, and had made a short botanical journey in Eastern America in 1823, was sent, in 1824, by way of Cape Horn to the Columbia River, where he arrived in April, 1825. He spent two years in Oregon, discovering some important trees, including Abies nobilis (noble fir), Abies amabilis (Lowland fir), and Pinus Lambertiana (sugar pine) the largest of its race.

In March, 1827, Douglas started from Fort Vancouver, on the Columbia River, crossed the continent by Hudson's Bay Company posts, and embarked for England, which he reached in October of the same year. Two years later he left Eng-

land for the last time and reached the mouth of the Columbia on June 3rd, 1830, remaining in Oregon until the autumn, when he sailed for Monterey. Here he remained until the next summer, discovering no less than a hundred and fifty species of undescribed plants, and then sailed for the Sandwich Islands. In the autumn of this year he returned to the Columbia River, and in the following summer extended his explanation as far north as the Fraser River, in which he was wrecked, losing his collections and instruments, and barely escaping with his life. But the beauties of tropical vegetation lured him from the awful solitude of the sombre fir forests of the northwest, and in October, 1833, he sailed again for the Sandwich Islands. Here he passed the winter, and on the 12th of July, 1834, while engaged in exploring the high peaks of the island, he fell into a pit in which a wild bull had been captured and several hours later was found dead and terribly mangled.

"Douglas is said to have introduced two hundred and seventeen species of plants into English gardens, the list including many valuable and beautiful trees, like the Redwood, the Sugar Pine, and the Douglas Fir. No other collector has ever reaped such a harvest in America, or associated his name with so many useful plants. By an unfortunate hazard of rate the noble Douglas Fir, the most important timber-tree introduced by Douglas and one of the most valuable trees in the world, does not, as might well have been the case, perpetuate his name in the language of science, and it is a humble primrose-like alpine herb which commemorates this explorer of forests and discoverer of mighty trees."

Canadian Paper in U.S.

In reply to a criticism at the recent newsprint "combine" investigation at Washington, Philip T. Dodge, president of the International Paper Co., made the following statement:

"It has been the boast and is the policy of the International Paper Company that no publisher having a contract with it shall ever suffer by reason of fire, flood, interruption of railroads, strikes, or any other interruption under which the company might claim exemption from its contracts to furnish paper. Although it is the policy of the company to keep from 37,000 to 40,000 tons in storage, at present the reserve is down to about 17,000 tons. There has been an abnormal demand for newsprint paper. Our mills are and have been operating at maximum capacity, twenty-four hours a day and six days in the week. We make one-third of the newsprint paper in the United States; one-third is made in Canada, and the rest by companies with which I have no connection. The unjust laws of the United States are sending the newsprint business of the United States into Canada. A few years ago there was an investigation of the paper business by a tariff commission, which found that the Canadians had an advantage of about $5 a ton over us. Yet Congress, when it came to consider that report, placed newsprint paper on the free list ,thereby increasing our disadvantage. At the time newsprint paper was placed on the free list fifty tons of paper were being imported from Canada every day. At present the importation amounts to 1,000 tons."

The General Fire Situation

Reports received from railway fire patrolmen in Ontario refer to the gratifying immunity from serious forest fires along the lines under regulation by the Dominion Railway Board. The last week of July, which did such damage in the Clay-belt, was responsible for insignificant losses in timber along the private-owned lines, although patrolmen reported some apparently severe fires working toward the tracks in places. Who can doubt that the favorable railroad record at such a period is largely due to efficient, well-supervised patrol?

Reports received by the Association from the 12,000 square miles of territory in Quebec patrolled by the St. Maurice Forest Protective Association indicate an excellent record thus far. While the rangers have had a number of fires to fight, the areas burned have not been extensive. The value of preventive work has again been manifested. Many fires have been encountered at the edge of the St. Maurice territory, originating beyond its borders, and these have given trouble. Rain fall has been heavy in Quebec this year.

Twenty-five fires have been put out on the Lower Ottawa Forest Protective Association's limits. Most of them were on old burns where young growth had barely taken hold. Berry pickers were undoubtedly the cause of some of the fire trouble, due to unextinguished camp fires. One fire was fought at Chelsea; as far as can be learned it originated with a cigarette thrown from a vehicle passing along a highway. Little trouble with settlers' fires has been encountered on the Lower Ottawa Association's areas this season. Vegetation was unusually heavy and dampened ground fires effectually.

A report from Fredericton, N.B., states that no serious fires have been reported during July on the Crown Lands of New Brunswick.

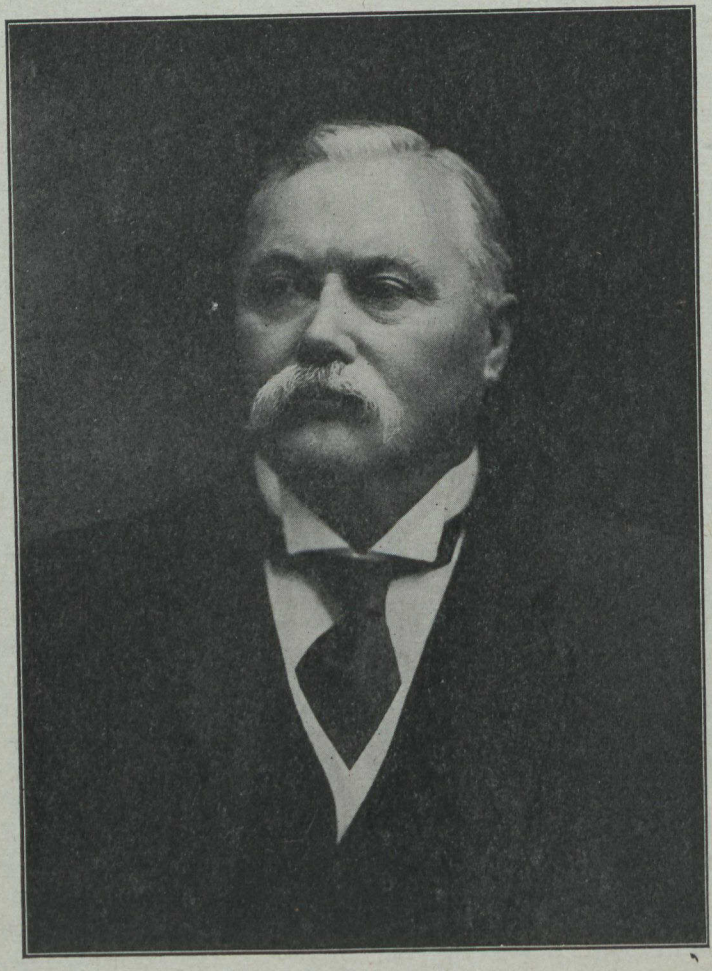
Protection of Trees

In many cases, when running wire fencing, it is advisable to attach it to trees, instead of setting down fence posts to carry it. If the fencing is attached directly to a growing tree the wire is soon overgrown and embedded in the wood, injuring, and, in many cases, killing the tree. To fasten the wire fencing to the tree, and at the same time protect it from injury ,a strip of board, an inch or an inch and a half in thickness, and three or four inches wide, should first be securely nailed upright to the side of the tree. The fencing should then be fastened by staples to this strip. In this manner very little damage is done to the tree, and the wire fencing may be removed at any time.—(Conservation.)

An Important Move by N.T.R.

Arrangements have been made wit hthe National Transcontinental in regard to the patrolling of their right of way through the territory of the St. Maurice Forest Protective Association by which the railroad will pay one-third of the cost of the labor and will pay for gasoline and oil consumed by the power speeders, the Association and the Province dividing the balance of the cost.

A special uniform has been provided for all the St. Maurice rangers this year in the form of a green shirt, with "Protection Forest" in red letters across the chest.



THE LATE JOHN HENDRY, Vancouver,
President of the Canadian Forestry Association, 1912-13.

The Late Mr. John Hendry

The death in Vancouver on July 17th of Mr. John Hendry leaves a great gap in the lumbering and forestry world. Mr. Hendry, born in New Brunswick seventy-two years ago, went as a young man to the Pacific coast long before the first Canadian transcontinental railway was built. He lived at first at different places on the Pacific coast, and even went as far east as Winnipeg, but in all his work and travels his mind was centred on British Columbia. In those days there was, of course, no Vancouver, and his first business location was Nanaimo, and, later, New Westminster. Where the centre of population and business activity was, there was Mr. Hendry, and his acumen and energy soon made him one of the leading men of the province. When Vancouver was located as the terminus of the Canadian Pacific railway Mr. Hendry and his associates extended their operations to, and eventually centred them in, that city. When the great fire of 1886 swept Vancouver off the map, Mr. Hendry and those associates, Mr. McNair, Mr. Beecher and Mr. R. H. Alexander, cleared out their big lumber sheds and for some weeks housed many of the homeless therein. They also generously distributed lumber to help the stricken citizens to rebuild. Mr. Hendry was not only in the community, but of the community, living its life and helping it forward in every way, and the citizens of Vancouver never forgot the part he played.

How he built up one of the greatest lumber-exporting businesses of the whole Pacific coast is well known to all Canadian business men, and here it is necessary only to point out that, busy as he was with his many concerns, he was always active in promoting the interests of his fellow citizens in the capacity of leader and representative. In New Westminster he took a deep interest in civic affairs, and, besides serving in other capacities, was mayor and president of the Board of Trade. He was later president of the Vancouver Board of Trade.

His Services In Forestry.

He was president of the Canadian Manufacturers' Association in 1910, and in crossing over to Europe on business connected with that organization, in doing some service for a fellow passenger, he slipped on a rug and broke both legs badly at the hip joint. He was attended by the ship's surgeon, but, the remainder of the voyage being rough, the bones did not set properly, and, though given the best medical treatment in England, he was never again able to walk without the greatest difficulty, and only with the aid of walking sticks. As Mr. Hendry was a big and portly man, and one who had in earlier years been full of bodily activity, this limitation was a great drawback to him. Nevertheless, he persisted in attending to business, which involved frequent and long journeys and in carrying on work of a semi-public character when many other men would have become luxurious invalids.

Mr. Hendry was president of the Canadian Forestry Association in 1912, and it was during his term of office and because of his enthusiasm that the Victoria Convention was held in that year. This Convention coincided with the introduction of the new forestry program by the

Government of the Province of British Columbia, and it was therefore one of the most important meetings ever held on the Pacific coast. From England by cable Mr. Hendry directed the work of preparation in the early part of the year, and at the Convention he presided and pushed things through to a most successful conclusion.

A Great Organizer.

Mr. Hendry had that sure touch of a great organizer and captain of industry—he was always able to pick out and surround himself with associates who had dropped the word "fail" from their vocabulary, and the result was the great organizations which they jointly built up on the Pacific coast.

He was a man of generous instincts, and was never happier than when surrounded by his friends at his stately home in Vancouver or on his steam yacht among the beauty spots of the Gulf of Georgia. He is survived by his widow and one daughter, Mrs. Eric Hamber, who, with his other relatives, have the sympathy of many friends both in this country and in Europe.

Fire Protection on the Railway Lines

Satisfactory progress was made during 1915 in the railway fire protection work, which has been handled during the past four seasons under the regulations of the Board of Railway Commissioners. The co-operation of the various federal and provincial fire-protective organizations has been given freely, and, with very few exceptions, the railways have also co-operated heartily and effectively.

A total of 686 fires in forest sections is reported as having originated within 300 feet of the lines of railways subject to the Railway Commission's jurisdiction. Of these, 43.4 per cent are definitely attributed to railway agencies, 27.8 per cent to known causes other than railways, and 28.8 per cent to unknown causes. Of the total area burned over, amounting to about 37,263 acres, 33.1 per cent is chargeable against the railways, 20.9 per cent to known causes other than railways, and 46 per cent to unknown causes. The total damage done is estimated at $74,256. Of this, the railways are definitely charged with only 11.2 per cent, while 24.2 per cent of the damage is due to known causes other than railways, and 64.6 per cent to unknown causes. Thus the railways, exclusive of government lines and a few railways having provincial charters, are directly charged with less than half of the total number of fires reported as having originated within 300 feet of the track; these burned over less than one-third of the total area reported, and did only one-tenth of the total estimated damage. This showing is distinctly favourable to the railways, especially when it is considered that this 10 per cent of damage totals less than $8,400. These figures show that the railways have been remarkably efficient in extinguishing their own fires, as well as those due to outside causes.

Of all fires reported, the causes are as follows: Locomotives, 33.9 per cent; railway employees, 9.5 per cent; tramps, etc., 11.4 per cent; settlers, 12.5 per cent; other known causes, 3.9 per cent; unknown causes, 28.8 per cent. It will thus be seen that the carelessness of tramps and settlers constitutes a very serious source of fire danger along railways, these two elements combined accounting for nearly one-fourth of the total number of fires reported.—C. L. in Conservation.

Quebec Limit Holders Extend Planting Idea

The activities at the Berthierville Forest Nursery of the Quebec Government, under the direct charge of Mr. G. C. Piche, continue to show interesting developments.

The Nursery has shipped this season over 380,000 plants of which about 9 per cent were hardwoods and the balance conifers. Three hundred and forty-five thousand plants were sold for reforestation purposes and the remainder for ornamental uses. The demand has been multiplying year after year so that it may be assumed the Quebec Forest Nursery is only at the beginning of its usefulness.

The Laurentide Company at Grand Mere have bought 240,000 plants, the Riordan Company have also started experiments, and the Bronson Company are taking similar measures. It is anticipated that next year several others of the limit holders will come into line with the planting movement and that several thousand acres will be yearly reclaimed.

The experience of the Quebec Forest Department is that the private owners are rapidly awakening to the possibilities of reforestation and their demands for information, seeds and plants are also increasing. Mention may be made of the Estate of the Seigniory of Perthius that has purchased 50,000 trees yearly from Berthierville since 1912. Two Montreal barristers, Messrs. Fleet and Lafleur have commenced the reforesting of their summer properties. Numbers of plants have been distributed to the colleges, convents, and other institutions to promote the establishments of small woodlots nearby.

One of the staff of the Forest School of Laval, Mr. Maheu, delivered forestry lectures in 14 colleges, met over 3,500 students, and 375 instructors. This branch of lecture work will be followed more extensively next year.

The summer's work of Mr. Piche's department was concerned also with the classification of lands, which was started in 1909, and it will require at least five years more to complete the task.

The Forestry School, under direction of Mr. Avila Bedard and Mr. Piche will spend the summer months on the limits of the River Ouelle Pulp and Lumber Company, making inventories of stands, marking trees in view of trying several systems of lumbering on forestry principles.

At the graduating exercises on June 18th, the following received their diplomas: Wm. Guay, Methot, Guillemette and Dufresne. Mr. Guay left for Manitoba in charge of a reconnaissance party for the Federal Government; Mr. Guillemette is attached to the Forest Service of the Province; Mr. Methot is spending the summer with the St. Maurice Forest Protective Association, and Mr. Dufresne has gone also to help in forest protection work at Mattagami, Ont.

It is anticipated that a good number of students will enter in September.

A View from Thessalon

Thessalon, Ont., "Advocate": In the Province of Quebec no one is allowed to set out fire for this purpose unless he has a permit from a fire warden. This is one of the many regulations that the Legislature of Ontario should lose no time in adopting. We trust it will not be forgotten.

How Plantations Are Thinned

Preserving the Wind Belt. When to Commence Thinning. Removing the Diseased and Dying Trees.

By H. M. Morrison,
Porcupine Forest Reserve, Usherville, Sask.

If one is to be successful in rearing timber for profit, there is, perhaps, no branch more important than a thorough knowledge of the art of thinning and yet this is a subject on which there is considerable diversity of opinion. What is the object of thinning, one may ask? Well, in the first place, it is to utilize that material in the plantation which otherwise would be rendered useless by rivalry of the other trees. Twenty to thirty per cent of the yield of a plantation should be given by thinnings. Thinning also stimulates growth and helps the development of the remaining trees and influences the deeper production and time of maturity of the plantation as a whole. It improves the soil as well as the remaining trees. It also prevents the formation of knots and useless branch wood. The life of the plantation may be lengthened or shortened by the mode of the thinning; when properly done and at the correct time it should render the remaining trees more proof against wind, storms, snow, insects and fungi. Final thinning is generally carried out with a view to promoting natural regeneration. In mixed woods thinning regulates the proportion of the trees in mixture.

No unchanging rules can be laid down for the thinning of plantations,it is to a great extent a matter of experience and good judgment, but the following general principles may be of use to those who undertake this work:

1. Study the relationship of trees and soil and act accordingly.
2. Begin to thin at the correct time and most sheltered spot.
3. Cut away all diseased and dying trees.

In thinning young or old plantations the work must always be subject to modification, according to the nature of the trees and soil and the ultimate use of the plantation which is being operated upon, and much forethought and discrimination are required.

When to Commence.

One of the most important things in thinning plantations is to know when to commence the operation. If it be delayed too long, the result is stems whose length is out of all proportion to their diameter. Such trees have not sufficient stem development in girth to withstand wind, storms, or snow whose weight they cannot bear. As a general rule thinning should commence when the plantation is from 20 to 25 years old and should be repeated at from intervals of from 5 to 10 years. When trees have finished height growth and have developed clean and branchless stems, thinning gives them more soil-room and light and thus increases nutrition. It also produces broader year rings and wood of better quality. Without it the wood is apt to be soft and springy.

The wind belt of a plantation which is usually from 20 to 30 yards deep should not be thinned as it protects the inner trees which may then be more severely thinned. Gaps in the plantation must be avoided. When the trees are much crowded, the thinning must not be too severe at one time. In thinning a wood which has been too long neglected, the outer margin should not be too severely thinned; and trees isolated by thinning are apt to be thrown by wind. In mixed woods with several species the more valuable trees require more protection than the rest.

Autumn and early Winter are the periods usually chosen for thinning plantations. But it should be remembered that at the latter time the lowest percentage of moisture (47 per cent according to Webster) is present and the timber therefore is then most valuable for construction purposes. Larch is ready for thinning at from 12 to 15 years, Scots Pine at about 25, Oak at 20 to 25, Beech at 25 to 30, Spruce and Silver at 30 to 35 years. Trees which naturally open out such as the Pine do not respond as surely to thinning as Beech and Silver, for if the Pine does not get sufficient light and space in time, it is suppressed for good. Therefore special care must be taken to thin Pine plantations and those similar at the time when they will respond. It is well to commence thinning the plantation at the centre or most sheltered spot, so that the outer intact boundary continues to form a shield against wind which might prove harmful to the trees which had previously stood in close formation.

Classes of Trees.

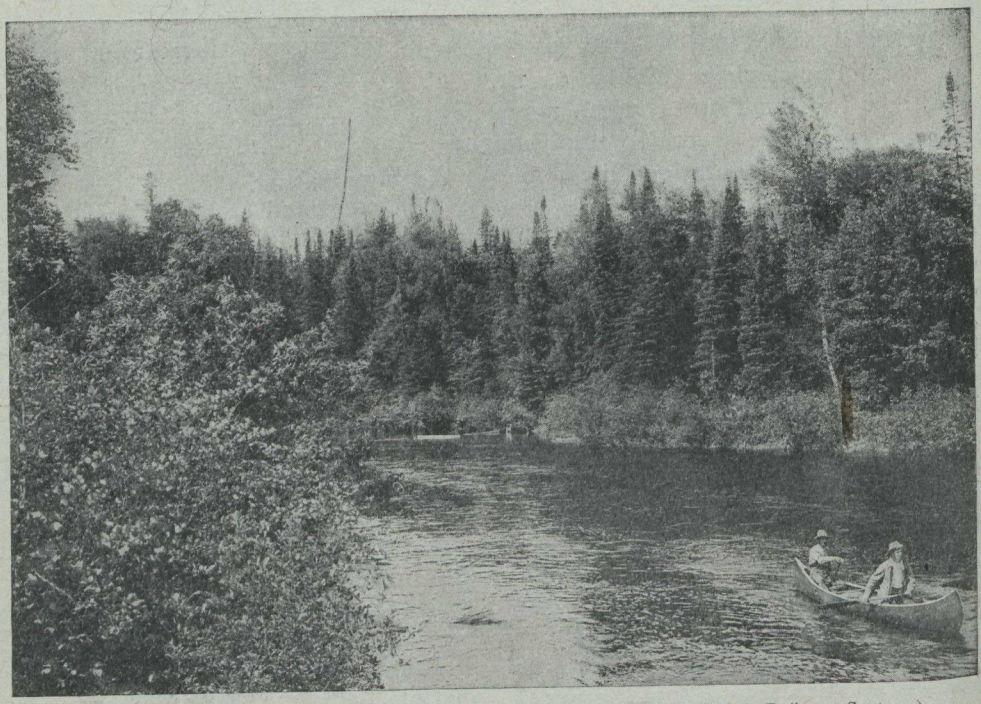
In a plantation we find the following classes of trees:

1. Predominating trees which have outgrown the others:
   (a) Trees whose stems and general formation are good.
   (b) Trees whose stems are bent and gnarled and altogether badly developed.
2. Dominating.
3. Dominated stems.
4. Suppressed.
5. Diseased and cankered.

In thinning it is well to retain as many of class 1 as possible in equal distribution all over, more particularly those of sub-division (a). If trees of class 2 interfere with the stems of class 1 (a) they should be removed, but care must be taken that this removal does not break the canopy which would result in windfall. Trees belonging to class 1 (b) should, if possible, be replaced by those of class 2 and this should be done early in the thinning process. In classes 3 and 4 pretty severe thinning among light demanders should be done. Shade bearers stand more crowding than light demanders—they can do with 30 to 50 per cent less space, therefore thinning need not be nearly so severe among them. Trees of classes 2 and 3, dominating and dominated, are those which require most light. As a rule dominated trees should only be removed when they are poor struggling specimens or of a species not wanted in the particular plantation being thinned.

I have in this paper only touched the fringe, as it were, of the interesting study of thinning and have not attempted to discuss the various methods practised in the forests of Germany, France and America. My aim has been to assist, if possible, practical beginners in this particular branch of the absorbing and fascinating subject of forestry.

The Monarch oak, the Patriarch of the trees.
Shoots, rises up, and spreads by slow degrees;
Three centuries he grows, and three he stays,
Supreme in state, and in three more decays.—Dryden.



(Courtesy of Grand Trunk Railway System.)

ONE OF THE ENTICING TRIBUTARIES TO LAKE TEMAGAMI.

Telephone's Use in British Columbia Fires

The telephone companies in British Columbia are co-operating with the Forest Branch in reporting of forest fires throughout the province. Operators are instructed to give precedence to reports of fires, and to give special messenger service to messages. Country subscribers are glad to report any fires, thus becoming voluntary patrolmen or observers. With the further extension of country lines better reporting service will be obtained, and that without cost to the government beyond toll charges.

There are, however, many heavily timbered districts into which commercial telephone companies will be unable to build for many years, and which must be provided with telephone service if the timber is to receive any kind of protection from fires. Into these districts, and to look-out stations, telephone lines must be built by the provincial government, and a number of such lines have already been constructed.

These lines all connect with commercial or Dominion government lines, and are open to use by the public. Instruments are installed in settlers' homes, stopping places, logging camps, or any other suitable location, besides forest officers' headquarters, wherever this can be done without overloading the line.

No. 9, B. W. G. galvanized iron wire is used exclusively, and strung on trees wherever possible, cheapness in construction being necessary. No. 37 Thomas split tree insulators are used on tree lines with a No. 32

Brookfield double petticoat pony insulator on 2-inch by 2¼-inch oak bracket at every fifth to seventh tie. No. 12 B. W. B. iron wire and No. 18 siezing strand is used for the ties. In stringing a tree line a maximum amount of sag is allowed to permit the wire to be borne to the ground by falling trees, instead of breaking. The wire must, however, clear a man on horseback.

Telephone wall sets are used where the instruments are in houses, while an iron set, is used where no protection is available. Patrolmen and repair men carry a portable set, No. 1375-A developed for the United States Forest Service.

Three hundred and sixty miles were erected during 1913 at an average cost of sixty dollars per mile; ninety miles in 1914 at one hundred and twenty-five dollars per mile, and 36.2 miles in 1915 at a cost of $26.50 per mile. The higher cost per unit in 1914 is due to the great expense of transporting material for the upper end of the line from Revelstoke to Big Bend, one hundred and twenty-five miles, which had to be done on pack horses, and the expense entailed in purchasing and laying four miles of submarine cable in the Heriot Bay line. This cable is single conductor seven strand No. 19 B. & S. copper tinned, 3/32 inch wall special submarine rubber tape serving of jute, with No. 10 B. W. G. galvanized steel armour. The cable was required for crossing Okisholow, Nodales and Cardero channels and Loughborough Inlet, the distances varying from twenty-eight feet to six thousand feet. The shallowest channel was four hundred feet deep and the deepest about one thousand feet. The cable was laid from a reel on a scow, towed by one of the government launches.

The following list of lines, constructed by the forest branch, is constantly being added to:

Hazelton-Suskwa River, twenty miles; Terrace-Lakslse Lake, seventeen miles; Heriot Bay-Loughborough Inlet sixty-four miles; Princeton-Five Mile Creek, twenty miles; Kelowna-White Mt. Lookout Station, twelve miles; Vernon-BX Mt. Lookout Station, eighteen miles; Grand Forks-North Fork Kettle River, forty-four miles; Erie-Second Relief Mine, fourteen miles; Arrow Park-Mosquito Creek, seven miles; Lardo-Duncan River, forty miles; Revelstoke-Big Bend, one hundred and twenty miles; Creston-Goat Mt. Lookout Station, three miles; Cranbrook-Baker Mt. Lookout Station, seven miles; Canal Flats-Upper Kootenay River, twenty miles, and Natal-Upper Elk River, forty-five miles.

Prof. S. B. Green on "Causes of Fires"

The following was written by Prof. S. B. Green in "Forestry in Minnesota" and has an interesting relation to the conditions giving rise to Canadian forest fires:

"Spring fires are very injurious to trees and especially tender seedlings for trees in the spring of the year are full of sap and can endure but little heat.

Summer and Autumn fires generally run deep into the ground and if the soil is very dry and of a peaty nature burn off the roots of the trees. The result of this is that the trees are blown down in great confusion and form what are known as "fire falls." Where a thick growth falls, it forms an almost impassable barrier which remains in this state until decay and repeated fires extending over a long series of years finally destroy the trees and perhaps get the land into condition for a new growth.

Causes of Forest Fires.—The only natural causes of forest fires are friction and lightning, both of which occasionally start fires in dead trees, but as such fires are most likely to be set during a rain they seldom do much damage. Practically all the injurious forest fires that have devastated the forested part of this section have resulted indirectly either from a lack of appreciation of the damage done by them or from carelessness and ignorance. **In the disastrous Hinckley fire of 1894 the damage was done by a large fire formed by the combination of several small fires that were allowed to smoulder in the swamps near** Hinckley for a week or more, which **when fanned by a dry hot wind attained an irresistible energy. If we had had a fire law that could have been properly enforced at that time, or if the people near Hinckley had been aware of their danger, that great fire, with its attendant great loss of life and property, need not have occurred.**

Fires often escape from settlers when they are clearing land and are sometimes started by them to make pasture for their stock. The careless use of fire by the hunters, prospectors and others who camp in the forest and leave their camp fires unextinguished is another common cause of fires. Railroads set many fires and should be required to more rigidly conform to the law requiring them to use spark arresters and to keep their right-of-way free from combustible material.

The moral effect of a properly enforced forest fire law is not only very great in restraining the careless, but especially in educating law-abiding citizens in the idea that there is value in young seedlings and timber trees.

The prevention of forest fires will be most certainly accomplished by educating our people to an appreciation of the amount of damage done by them.. **In some counties in this state it is impossible to enforce the law against setting forest fires owing to the belief that fires are a good thing for their sections in destroying tree growth and bringing the land into condition to be easily taken up by settlers.** There is some truth in this claim, but since the fires destroy all increase on the land they sweep over, a large amount of it is thereby rendered entirely unproductive long before the settlers are ready for it, while in the meantime it might be producing a crop of valuable timber. Then again, it is the greatest injustice to allow one person to burn the property of another, which right is practically claimed by those who advocate the unrestricted use of fire."

Huge Timbers for New Fleet

Responding to invitations extended by the officials of the British Columbia Mills, Timber and Trading Company, Limited, many Vancouver citizens paid a visit recently to Hastings Mills—a landmark on Burrard Inlet for over half a century—to inspect some unusually large timbers which had been cut to order. Three of the huge sticks of Douglas fir measured from 110 to 116 feet in length and 20x20 inches in girth, and were manufactured to the order of the Wallace Shipyards, Limited, North Vancouver, to form the keels of the first of the fleet of wooden schooners to be constructed under the new Shipping Act of the British Columbia Government. Another massive timber, 100 feet in length and 28 inches in diameter, was being fashioned by ship carpenters into a mainmast for the brigantine Amy Turner, of Vancouver, and was pronounced one of the finest sticks ever brought into Van-

couver, being without blemish from stem to tip when shaped and polished. The sticks supplied for the other spars, while not so large, were equally free from defects. Other large timbers of varying lengths and diameters were being assembled for shipment by rail, and the collection formed an impressive exhibit of British Columbia forest possibilities and mill equipment. The big timbers came from the limits of the British Columbia Mills, Timber and Trading Company, Limited, at Rock Bay. It is not generally known that at one time the company furnished the majority of the mast and spar timber for use in the British navy, and so large are its reserves that no difficulty would be experienced today in duplicating the business.

Tree Planting to Overcome Sand and Snow

The railways of Canada are taking an increasing interest in the planting of trees and shrubs to secure better control of drifting snow and drifting sand, both of which interfere seriously with the operation of trains.

East of Montreal near Vaucluse, in Quebec, light drifting sand has given trouble to the Canadian Pacific railway since the very thin sod was plowed up, writes B. M. W. in "Conservation." Hot boxes resulted to rolling stock and passengers suffered from dust. The ordinary right-of-way fence was covered by the sand, and cattle could stray out on the track. Snow fences were used to some advantage, but in a bad season these would be almost covered up.

In 1915 a number of grasses, including Brome, were planted but perished from the heat, which is excessive on these exposed sand beds. This spring, 3,500 cuttings of cottonwood (*Populus deltoides*) and 1,000 one-year transplanted jack pines were planted. An examination made after the trees and cuttings were in the ground a month showed that approximately 95 per cent were making good progress.

Cottonwood Used.

The cottonwood was placed in rows two and one-half feet apart, the distance between the rows being four feet. The jack pine was planted in rows six feet apart, distance between the rows five feet. The distance from the last row to the centre of the track is about 150 feet. All the planting parallels the track.

It is hoped that the vigorous growth of the cottonwood will protect the jack pine until such time as the latter can take care of itself. If the results prove satisfactory, other situations along the company's line will be planted in the near future. The unusual amount of rain which has occurred this spring and early summer has contributed very materially to the prospects of success.

For a permanent snow fence which would grow rapidly and have sufficient foliage, 6,000 Norway spruce and 15,000 caragana were planted. The former were five-year transplants, of from 20 to24 inches height, of heavy sturdy crown and well-developed root system. The caragana were from 30 to 48 inches in height and about three years of age. The caragana, as well as 1,500 lilacs used in mixture for snow breaks, are from the nursery of the company at Wolseley, Sask.

Planting Methods.

The following methods of planting were carried out: Where the distance from the track to the right-of-way fence is over 50 feet, a "standard" break was put in, viz., one row of spruce was planted 8 feet apart, and in front of this, caragana were placed two and one-half feet

apart. The distance between the rows is six feet. If there was only fifty feet between the track and the fence one row of Norway Spruce was planted six feet apart or two rows of caragana forty-six feet apart. On several situations one row of caragana was planted.

The open-grown Norway spruce is the best tree that can be used for snow breaks in Eastern Canada. It is of rapid growth, is comparatively free from enemies, and branches close to the ground. It will require protection from fire. It is expected that the Norway spruce will be effective as a snow break alone in five years.

Caragana arborescens, the Siberian pea tree, when well trimmed, at its present height ought to provide a good mesh for snow break the second year after planting. Caragana is hardy, free from insect activities, not attacked by cattle, of quick growth and beautiful foliage. It sprouts well.

At some of the company's stations, spruce, caragana and lilac were used for wind break and for improving the grounds.

Praise for H. R. MacMillan's Good Work

Referring to the work of the Forest Branch of British Columbia, the Forestry Quarterly pays tribute as follows:

"To cap the climax of this remarkable activity of the Forest Branch in securing markets, the Chief Forester, Mr. H. R. MacMillan, who is responsible for developing this phase of the Forest Branch, was appointed Special Trade Commissioner of the Dominion Department of Trade and Commerce, and has been traveling for nearly a year to all parts of the world, with a view to establishing trade connection for British Columbia mill products and furnishing insight through personal knowledge into special requirements of markets.

"Of course, all this literature, which is distributed freely by the hundred thousands, is frankly propagandist and advertising matter, but, considering the source, must be truthful and authoritative, devoid of extravagant claims which a private concern might make.

"From the forester's point of view at first sight, this canvassing would appear out of his field, but as a matter of fact, application of forestry methods can only be afforded when the cost of the dead work—dead for the present—always involved in any forestry work—work for the future—is covered by the price obtainable for the present product. To find profitable markets and extension of use of minor materials particularly seems to us a most needful undertaking, especially in British Columbia, where for years the lumber industry has been suffering by its distance from markets.

"There is one result which will come to the Forest Branch from this well-directed propaganda which must not be underrated, namely, that it will ingratiate itself with the lumber industry and through that with the politicians, so that it will be possible more readily to inaugurate conservative processes of forestry practices. We congratulate Mr. MacMillan on his enterprise in going out beyond mere routine administrative work."

Timber Resources of the Queen Charlotte Islands

Splendid Growth of Spruce, Hemlock and Cedar. Virgin Stands of Huge Girth Timbers

By Roland D. Craig,
Commission of Conservation, Vancouver.

The Queen Charlotte Islands were so named by the explorer, Capt. Portlock Dixon, who in 1789 visited these islands in his ship "Queen Charlotte," but little was known of them from the geographical standpoint until explored and mapped by Geo. M. Dawson, of the Geological Survey, in 1878. Even yet the people of Canada do not appreciate the extent and the resources of these islands.

Physiographically they form a part of the partially submerged range of mountains including the Olympics, Vancouver Island, Prince of Wales Island, and the other mountainous coastal islands of Alaska. Being separated from the mainland by a stretch of water from 50 to 100 miles wide, known as Hecate Passage, these islands were unvisited except by a few traders and scientists until the advent of the Grand Trunk Pacific Railway turned the attention of investors to these northern lands.

The group of islands extends in a north and south line about 150 miles, Graham Island and Moresby Islands being the most important ones, with several others of considerable size, such as Burnaby, Lyell and Louise, lying along the eastern side of Moresby Island. Graham Island, the most northerly, is 53 miles wide at the north end, 25 miles on the south end, and about 50 miles from north to south, covering approximately 2,000 square miles. Moresby Island is about 30 miles wide on the north end, and with the adjoining islands gradually tapers to a point 100 miles south, with an area approximately 1,200 square miles.

A range of mountains extends along the western side of Graham Island and down through Moresby Island to the southern extremity, leaving about three-quarters of Graham Island on the east side practically flat country. Moresby and the adjoining islands are nearly all mountainous and rough in contour.

Graham Island is indented on the north side by two large harbors, Masset Inlet and Naden Harbor. The former, after traversing a narrow channel for 17 miles, opens out into an irregularly shaped expanse of water about 18 miles from east to west and six miles from north to south. Naden Harbor, with its approach, Virago Sound, extends about 14 miles back, and after a narrow entrance widens to a fine protected harbor six miles long by four miles wide. Skidegate Inlet, which divides Graham Island from Moresby Island, forms an excellent harbor on the south, and all along the east side of Moresby Island the Coast is indented with bays and passages which are navigable for large ships. The west coast has few harbors, Rennell Sound, on Graham Island, being the only one affording adequate shelter for shipping. As a consequence, it is uninhabited, and with the exception of some oil prospectors has been little visited.

Climate Agreeable.

The claimate of these islands is mild and equable owing to the influence of the Japan Current, and though there is considerable cloudy weather the precipitation in both snow and rain is only about half what it is on the adjacent mainland, being only slightly more than that of Vancouver.

The Queen Charlotte Islands are rich in natural resources, chief among which are fish, timber, agricultural land, coal, oil, copper, silver, gold and other minerals. Agriculture will be confined largely to the flat lands on Graham Island, of which, it is estimated, there are 400,000 acres which can be brought under cultivation. This land lies at from 200 to 500 feet above sea level and for the most part is of a muskeg type, the mineral soil being overlaid with moss and decaying vegetable matter for a depth of from three inches to two feet, probably not averaging over eight inches. There is a scattering of scrubby timber on these lands which entails some clearing, but the chief necessity for cultivation is drainage. Settlements have been started at several points on Masset Inlet and Skidégate Inlet, and these have demonstrated that the soil and climate is conducive to the successful growing of all kinds of garden produce, small fruits and live stock. The farm produce from these islands has twice secured the first prize for district exhibits at the Prince Rupert agricultural show.

Spruce of Large Sizes.

The timber on Graham Island is composed of hemlock, spruce, red cedar, yellow cedar and jack pine. On flat lands the merchantable stands are confined to the shore lines and watercourses where drainage is afforded. The spruce grows to immense sizes, often eight feet in diameter and 250 to 300 feet high, but that growing along the shore is inclined to be limby and in places conky, so that it does not cut out a high percentage of clear timber. Farther back from the water, where it is less exposed, it is of a better quality. The hemlock is, as a rule, superior in quality to that found in the southern part of the province and will be perhaps the most important forest species. The red cedar, though it grows to large sizes, is not, as a rule, very sound, and will be more suitable for the manufacture of shingles than lumber. The yellow cedar, which grows in the more swampy or the higher sites in places reaches merchantable size, but on the flat lands it is generally scrubby and tapers very rapidly from the butt. The jack pine will be useful for mining props, fuel, etc., but cannot be considered as saw material. These observations refer to the timber on Graham Island generally, though along the rivers and shore line of the inlets and lakes there are excellent stands of timber which will run from 25 M. to 100 M. per acre over considerable areas. This heavy stand does not, however, extend back far from the drainage lines.

On Moresby and the adjacent islands the more mountainous nature of the land permits of better drainage and there is very little muskeg, the hillsides being covered with a good stand of timber of the same species as above. The quality of the timber is generally better than that found on the wetter lands of Graham Island.

The timber on these islands, of which there is estimated to be from twelve to fifteen billion feet, has not been exploited to any extent as yet, though there are three small sawmills on Masset Inlet and two on Skidegate Inlet, but their operations have been very limited. The present demand for spruce has resulted in some activity in this region, but the cut is not large.

Future for Pulp Mills.

This timber is especially suitable for the manufacture of pulp and un-
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doubtedly in the near future this will become an important industry in the Queen Charlottes in combination with the lumber and shingle mills. The lack of adequate transportation facilities is the chief deterrent of the development of the islands at present.

Coal has been prospected and developed to a certain extent on Graham Island for many years, and the prospecting for oil on the west coast of the island is being energetically pursued with encouraging indications of success.

Of the other minerals the chief development has been at the Ikeda mine, near the southern end of Woresby Island, which has been turning out valuable copper ore for several years. There are a number of other good prospects in this vicinity. Though rich float containing gold has been found on Graham Island, the source has not yet been discovered.

The waters around Queen Charlotte Islands provide perhaps the best halibut fishing on the coast, and salmon, cod and other valuable fish are abundant.

This is a part of British Columbia the resources of which have as yet not been realized, but which will become a source of great wealth when they are developed. Situated within eighty miles of Prince Rupert, and directly on the route which will be followed by the shipping which is bound to develop between that port and the Orient, the transportation question will soon be solved, and then this outpost of the province will become an important industrial region.

The Fake Settler

(By James Lawler.)

A tale there is, and it must be told,
Though it shame our native land,
Of injury done to Canada's weal
By the fakir settler band.

The settler true is a man to praise,
We shout to his tribe, "All hail!"
But the pseudo-settler's fitting place
Is a cell in a county jail.

The settler true goes into the bush
And hews himself a farm,
And cities and seaports and industries grow
'Neath the guard of his strong right arm.

But the fakir settler goes to the woods,
The spruce and pine to steal;
He cares nought for the lumberman,
Nought for the public weal.

His aim is only to get the logs—
He pays no tax nor due—
And when he has skinned the timber off
He hikes to pastures new.

Parliament members he worries with lies,
He knows not a plow from a spade,
He never yet grew a bushel of wheat,
Perjury's part of his trade.

The fakir-settler's vilest trick
Is one he plays with a torch;
If the nearest lumberman will not "cut"
He gives the timber a scorch.

To scorch the trees that they must be cut
Is the fakir-settler's aim,
But often it ends in a holocaust,
With the township wrapped in flame.

Then its "Hip-hurrah" for the settler true,
Whose name is with honor linked,
But its prod and slam the settler sham
Till his tribe is clear extinct.

"Ten Pounds Fine"--A Hint From the Fire Laws of 1832

"For Protection of Lives and Property. Severe Pains and Penalties Should Be Inflicted"--Gov. Simpson's Council

The following notes of regulations in regard to fire established by the Council of Assiniboia which administered affairs in the Red River Settlement, are from Volume 1 of the Canadian Archives Report, 1914, "The Canadian Northwest—Its Early Development and Legislative Records."

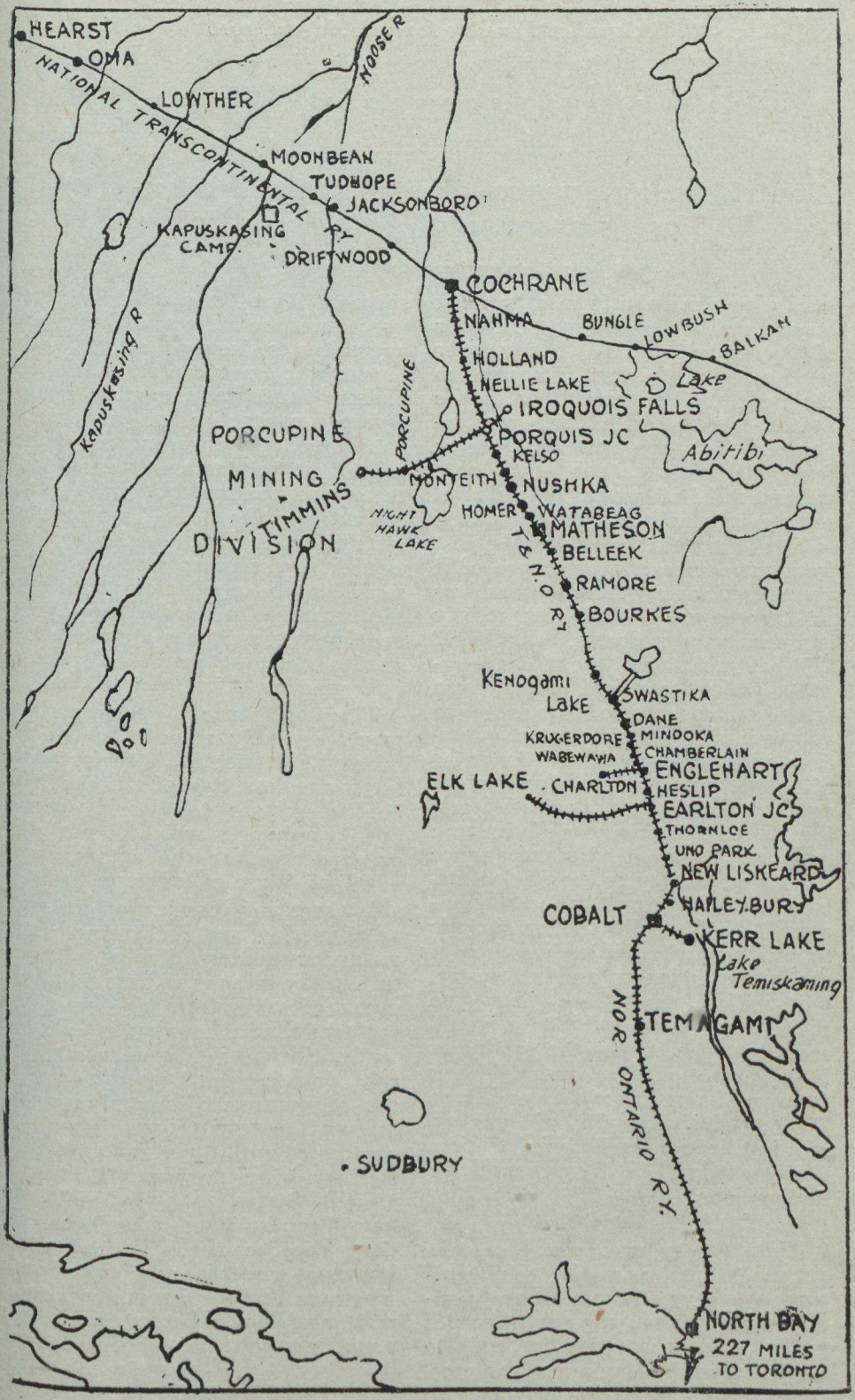
Proceedings of a Council held at Fort Garry on Friday the 4th day of May, 1832.

Present: George Simpson, Esq., Governor of Rupert's Land, President; Donald McKenzie, Esq., Governor of Assiniboia; James Sutherland, Esq., Councillor; James Pritchard, Esq., Councillor; Robert Logan, Esq., Councillor.

The great injury done to the woods of the settlement by fire and the serious danger and loss occasioned annually by that devouring element, arising from the wilfulness of some ill-disposed persons, and the negligence of others, render it absolutely necessary, for the protection of lives and property, that salutary regulations should be formed with a view to check this evil, and that severe pains and penalties should be inflicted on all persons who may violate such regulations. It is, therefore,

Resolved, 1st. That in all cases where it can be proved that the proprietor or occupant of land lights a fire, between the 1st of March and the 1st of December, for any purpose whatsoever, at a distance exceeding fifty yards from his house even upon his own lands, he be fined in the sum of ten pounds, which will be levied forthwith by the sale of the party's effects if necessary, one half of which fine shall be paid over to the informant and the other half retained in the hands of the Council, as a fund to meet such objects as they may hereafter be desirous of carrying into effect connected with the welfare and prosperity of the settlement.

Resolved 2nd. That, in all cases where it can be proved that any person lights a fire between the 1st of March and the 1st of December, either in the woods or plains beyond the boundary of his own property or farm, either ten miles of the banks of the river on either side whether it be productive of any injury or not, he be fined in the sum of ten pounds, to be levied as stated in the foregoing resolution and to be disposed of in like manner, except in cases where such fires may have been lighted through absolute necessity, of which the Council alone (shall) be competent Judges and, if the party so transgressing be destitute of means to pay the fine, he be banished from the settlement and subjected to hard labour, and the produce thereof be applied to the liquidation of the fine.



Scene of the Northern Ontario fires of July 28 and 29. About 1,200 square miles devastated between Ramore and Cochrane, with a loss of about 250 lives, and whole or partial destruction of Cochrane, Porquois Junction, Iroquois Falls, Kelso, Matheson, Nushka, and Ramore.

The Commonsense of Silviculture

An Address by Raphael Zon, U.S. Forest Service, at the Closing Exercises of Yale Forest School

In a few months from now most of you will be knocking at the door of Opportunity and offering your services as professional foresters to the Federal Government, or to the States or to private lumber companies. Although you will emerge from the forest school in th efull armament of all-around knowledge, some cynics will tell you that much of this armament will soon be lost from mere disuse, while more of it you will throw overboard yourselves as unnecessary ballast that merely hampers your progress.

What part then of the mental baggage which you wil ltake from school will prove the least useful to you in life? Will it be forest valuation with its complicated formulas of soil and forest rent, or forest management with its ideal "normal forest," or lumbering, or silviculture or what? Will life demand service from you as loggers, or silviculturists, administrators, or forest managers? Judging by the pessimistic tone of a number of leading men in the lumber industry, and in forestry, who in late years have expressed their views on the subject, it would seem that the sooner the graduates from forest schools forget all their technical forest knowledge and learn the mechanical details of logging, wood utilization, and administration, the greater will be their chances for finding jobs.

Is the Country Ready?

This country, we are told, is not yet ready for the practice of silviculture: we have too many purely administrative problems yet to settle; we have fire protection methods to work out and boundaries to determine; we have logging problems to solve and problems in timber sale procedure; we must wait for stumpage prices to rise more nearly to the level of the European prices and the country must become more settled before the practice of silviculture can begin; our virgin mature timber must first be cut and our silvicultural practice should begin with the second growth; there is no particular need, therefore, for the application of silviculture; common horse sense, ability to get along with people, a ready knowledge of lumber and logging problems are all that is needed to equip a man for a successful career as a forester.

The acceptance of such a view would virtually amount to the admission that much of forestry training is needless, that of all schools of applied science the forest schools are the only ones which do not fully prepare men for the actual work which they are called upon to do.

Is there any justification for such an admission, and is there not some misunderstanding of what silviculture really means? Those who still speak of silviculture as something for which this country is not yet ready, think of European silviculture, or refined and intensive methods of planting, of the minute care in handling each forest stand, as contrasted with the rough and ready methods of cutting practiced in the United States today. While we have been told on many occasions that the science of silviculture knows no countries and is applicable wherever forests grow, yet, as a matter of fact, what we have been actually taught have been methods of silvicultural procedure as developed and adapted to the economic

(Courtesy of "Forest Leaves" and Prof. J. S. Illick, of Philadelphia.)

STAND OF SCOTCH PINE PLANTED 32 YEARS AGO SOUTH OF RHEIMS, FRANCE.

conditions of Germany and other parts of Europe of many decades ago. The first American foresters who went to Europe to ascertain the methods of silviculture found, much to their dismay, that there are only a few places in this country where clear-cutting and planting are possible; that the shelterwood compartment method requires permanent roads and a constant market for all products; that most of the clear-cut systems with natural reproduction as practiced in Europe are impossible here, because we may not be able to clear-cut the forest at all; that there are but few places where the coppice method can be carried out as in Europe; and that the selection system, which seems best suited to our conditions, is regarded in Europe as a very poor method except in the mountains where the forest cover must be kept intact. The wise ones and those of a practical turn of mind soon realized the impracticability of this kind of silviculture and condemned its practice in this country altogether, or at least for the present; and those who persisted in applying the German silvicultural methods to the forests and economic conditions of this country deservedly earned the name of impractical and brought silviculture very much into disrepute. It was very unfortunate for us that at the beginning of our work in this country we accepted the silvicultural systems as developed in Europe as the only possible scientific silviculture, when, as a matter of fact, they were only empirical rules developed with special reference to given species and economic conditions. We were not taught the fundamental facts about

our forests—the real science that underlies the practice of silviculture in this country, the life histories of our species, the development of our forest stands.

What Is Silviculture?

Silviculture is the application of the knowledge of the requirements of different kinds of trees to the perpetuation of the existing forests, or to raising new ones and working them to the best advantage of the forest owner. In other words, the relation of silviculture to the utilization of the forest should be the same as the application of any science to an industry.

The practice of silviculture is predicated only on one condition; namely, that the land is to be maintained in forest, just as successful agriculture is based on the condition that the land is to be used for the growing of field crops. And just as agriculture existed long before agricultural colleges were established, so some rough silviculture was practiced in this country before the forest schools were born. Silviculture, as a matter of fact, is now being evolved in this country although silviculturists may not even be aware of it. Silviculture certainly can not be evolved from books only, or in the class room; it needs close observation, original and careful studies, and actual experience on the ground. In the early days of logging in Maine and throughout the Northeast, as well as in the South, when only the largest trees were cut and logs 16 and 18 inches in the top were taken out, a selection system of cutting was going on which resulted in most cases in splendid natural reproduction both of spruce in the North and yellow pine in the South. This method of logging was in a sense silviculture, although unconsciously practiced by the lumbermen; it was a silvicultural method which foresters, had they been active then, could have advocated for the perpetuation of the forest, and one fully in accord with the economic requirements of that time. If we free ourselves from the mental shackles imposed upon us by the manuals on silviculture, that the practice of silviculture consists only of using the several European silvicultural systems, and take a broader view of silviculture as any method possible and justifiable under economic conditions which may bring about the perpetuation of the forest, then silviculture can be practiced and is being practiced today in this country. It does not need to wait until the stumpage prices increase to the level of those in Europe, or until the population becomes dense, or until all of our administrative problems are settled. Silviculture is being practiced, on land which is maintained for forest purposes, the moment cuttings begin. On such land silviculture, as a matter of fact, is inseparable from logging. It is largely through the axe that silvicultural plans are realized. The first cuttings on the National Forests involved some practice of silviculture whether we knew it or not. Possibly it was bad silviculture, but it could just as well have been good silviculture if we had known more about it. If we do not practice good silviculture it is not because the time is not ripe for it, or because the need for such silviculture does not exist, but it is because our knowledge is still inadequate and we do not yet know enough of the life history of our species and of our forests to be able to devise the most efficient and practicable methods. If you hear, therefore, an administrative officer say that he can not afford to practice silviculture because of economic limitations, because of the cost of logging, because of other more pressing problems on his hands, you may be certain that he is thinking of some German silvicultural system and does not sufficiently analyze the actual situation. The truth of the matter is that he can better afford to postpone the regula-

tion of cuttings or the preparation of a working plan or even the perfecting of his plans for fire protection, but he can not afford to delay the practice of some form of silviculture when he begins cutting and making some provision, as he must, for the perpetuation of the forest. Given definite economic conditions, the necessity of providing for the perpetuation of the forest, and adequate basic knowledge of our forests, some system of silviculture is bound to be devised which will be both efficient and practical. And the more fundamental knowledge there is regarding our forests, the simpler and more practical will be the silvicultural systems devised.

Practice Silviculture Now.

If we are to wait for the time when the shelterwood compartment method, or selection cuttings in groups, or some other approved German silvicultural system can be applied to our forests we may not have any opportunity to practice silviculture at all, because, aside from economic considerations, those systems may not fit the biological requirements of our species, climate, or logging methods. If we look, however, upon silviculture as logging modified even to a slight extent by the forester for the sake of keeping the woods going forever, the opportunity for the practice of silviculture is now at hand almost everywhere.

The tie-cutter in Pennsylvania or South Carolina, who has learned from observing the growth of chestnut and loblolly pine that if he cuts those trees only that make three ties he can come to the same place every five years and cut the same number of ties, is practicing silviculture. When the pulp mill men cut only the mature spruce and fir and leave trees below a certain size in the woods for future cutting and stocking of the ground, they are practicing silviculture. When the cutter of firewood in New England has learned that by cutting his woodlot at the rate of one cord of wood a year per acre he can continue to use his woodlot forever without diminishing the supply, he is practicing silviculture. When a forest owner cuts clear his mature timber and leaves the young growth and protects it from fire, he is practicing silviculture.

In the early cuttings on the National Forests in western Idaho, in the western white pine and larch stands, the tendency was to sell both pine and larch, for fear that if the larch were left uncut it would seed the ground and thus eliminate the more valuable white pine from the future stand. The lumbermen, however, strongly objected to taking larch, since it had no market and, because of its weight, it was costly to log. The result was that while nominally the government charged the lumbermen for larch, its price was actually deducted from the price of the white pine. A study of the natural development of the western pine-larch forest revealed the fact that after a burn or any other clearing the larch is invariably the forerunner of the white pine; that it acts as a nurse tree under whose shade the white pine seedlings find just the conditions which they need for their growth; that within fifty or seventy-five years the western white pine catches up with the larch and eventually overtops and crowds it out altogether. It was shown, therefore, that there is no danger of the larch monopolizing the entire

ground and preventing the white pine from coming in. This led to a change in our silvicultural practice. Instead of sacrificing the larch—a tree of the future which probably in the next ten years will come into its own—as well as rendering unfavorable the conditions for regenerating the pine, most of the larch is now left on the ground to wait for a better market and meanwhile act as a protector to the young pine growth. In this case the practice of silviculture not only meant better reproduction of the forest, but also greater revenue to the government and simpler and cheaper logging to the operator. This silvicultural practice is as advantageous on privately owned pine-larch forests as it has proved to be on the government owned forests. As a matter of fact it was the observation of what follows the cutting out of the pine and leaving the larch, as practiced by lumbermen on their own lands, that led to the conclusion that such a practice is not only economical and profitable, but also silviculturally sound.

In Hand With Logging.

These examples, I believe, show that silviculture must go hand in hand with logging. If I may be allowed some paradoxical definitions, I would define "silviculture" as logging that leaves the ground in a condition capable of restocking; and would define "logging" as the practical application of silviculture. To be a successful logger of lands which are to be retained in forests one must be a keen silviculturist, and to be a successful silviculturist one must be a skilful logger. Therefore, when lumbermen tell you that the kind of foresters they want are those who can log and not those who know silviculture, and yet profess that they wish to keep their woods going and producing timber, they are not picking the right man. This misconception of what silviculture really means and its possible place in our present day logging operations on land that is more profitable for timber growing than for agriculture, has led many a timber owner to give up silviculture as an impractical and unprofitable thing, and many a forester to become discouraged in the future of his own profession. Even some forest schools have fallen victims to this misconception, and, instead of training men thoroughly grounded in fundamental knowledge and thus adapted to the practice of the kind of silviculture which is really needed, have begun to flirt with logging engineering, blacksmithing, and what not; and apparently are trying to develop a new type of professional men—a cross between a lumber jack and a "half-baked" engineer. And this forest school product is what they adorn with the diploma of bachelor or even master of forestry. There are already enough lumber jacks and mediocre engineers in the world, and no high grade school is needed to produce them. Engineering as a profession is now so highly developed that anyone who really wants to become proficient in it and specialize in logging machinery and other phases of logging engineering, will find a technical school of high standing better suited for his purpose than the average forest school as now organized. The result of such a flirtation, I fear, can be only that these forest schools will produce neither good engineers nor good foresters. The country does need, however, professional men who have a clear understanding of the limitations which economic conditions of the lumber industry impose upon the practice of silviculture, who have a fundamental and thorough training behind them, who are free from doctrinairism who are capable of evolving simple and practical methods of utilizing our woods and at the same time providing for their perpetuation.

(Continued in September Issue.)

Ontario Editors Demand Reform of Ontario's System

A Few Lines From Some of the Critical Comments in Ontario Newspapers Since the Forest Fire Tragedy

"Ottawa Evening Journal," Aug. 1, 1916: Ontario is the only province without a brush law. Let this grim tragedy be the last to blacken the annals of the Northland. Life and property must be made safe, and it is up to Ontario to grapple with the problem. Make good laws and enforce them.

Settlement of the North.

Toronto "Globe," Aug. 2, 1916: The clearing of land by fire, except under the direct supervision of competent Government overseers, should be absolutely forbidden. It is forbidden in almost every other part of the continent except Ontario.

Must Fight Fire.

"Toronto Daily Star," Aug. 1, 1916: We must fight fire as we would fight the invasion of a foreign army. The actual money loss caused by a great forest fire is far beyond the most liberal expenditure for protection.

Insurance Must Be Increased.

Toronto "Mail and Empire," Aug. 2, 1916: Whatever the cause of such disasters, the insurance against further experiences of them must be increased, regardless of cost. The settler must be assured, so far as it is possible for public regulation and efficient public service to assure him, against the contingency of forest fires."

Where Ontario Stands.

"Financial Post," Toronto, Aug. 5: Despite the awful warning of the catastrope of five years ago, the evidence is not wanting that the necessary and obvious precautions for the protection of Ontario's citizens and Ontario's public domain have not been taken. We cannot imagine the officials of any efficinetly operated private corporation, with the same resources at stake as those of the province in the Northern district, neglecting to take every possible precaution for the protection of their assets.

What Ontario Needs.

Peterboro "Times," Aug. 5, 1916: The Ontario Forest Protection Service stands urgently in need of three main reforms which, year after year, have been urged upon the Governments by the Canadian Forestry Association, the Commission of Conservation and other bodies:

1. Remodelling of the ranger service so as to give real protection to the forest wealth of the province. The Ontario system is recognized generally as out-of-date and inefficient.

2. The employment of inspectors in the ratio of at least one inspector to ten rangers. Over an area of 10,000,000 acres, Ontario has just eight supervisors, each being required to manage on an average of 36 men.

3. Sufficient rangers must be provided to completely patrol the Clay Belt, and these rangers must have authority to control the burning operations of settlers.

The Government's Part.

Toronto "Globe," July 31, 1916: The clearing of land is like reforesting—a matter for Governmental supervision. The danger of clearing by fire needs no argument, but the injury is not fully appreciated. The knowledge that ashes are a fertilizer has caused much mischief. The burning often does vastly more injury to the soil than the ashes can restore.

"A Provincial Disgrace."

"Ottawa Evening Journal," Aug. 1, 1916: In the matter of forest fire protection this province has shown amazing lack of progressiveness and intelligence.

It is doubtful if there is a community on this or any other continent that has suffered more in life and in treasure in recent years from forest fires than the province of Ontario. It is certain that none has shown greater feebleness or negligence in dealing with the problem.

Ontario has been content to get along with a fire protection system that does not protect.

Ontario has displayed a carelessness or worse that has been nothing less than disgraceful.

What the province needs is something in line with the system adopted in many of the States of the Union to the south and in some of our own provinces that Ontario complacently regards as unprogressive.

A More Effective Policy Needed.

Peterboro "Examiner," Aug. 2, 1916: We have a duty to urge upon the Government a more effective and energetic policy of prevention. It is not to be denied that the Province of Ontario has not dealt with the menace of forest fires with the energy and completeness of other provinces.

Ontario Is Lagging.

"Industrial Canada," July 31, 1916: Ontario's forest protection system has witnessed little alteration in design for thirty years or more.

The Harvest of Forest Fires.

"Pulp and Paper Magazine," Montreal, Aug. 15, 1916: Vast areas of our north land have been swept bare of trees and have become barren wastes. Much of this land is unfit for cultivation, and once the trees have been destroyed, the shallow soil washes away and we have nothing but bare rocks and desolation.

An Incontestable Fact.

"Ottawa Citizen," Aug. 1, 1916: The fact remains incontestably that the Provincial Government has never really taken the problem of fire protection in Northern Ontario seriously.

The one step which should by all means be taken is the passage of an Act providing for the adoption of the settlers' burning permit system.

Must Be Some Way.

Toronto "Mail and Empire," Aug. 10, 1916: The man who has some acres of slash is inclined to be self-willed in regard to applying the match. There must be some way of establishing an iron authority over such men. It is surely better that half a dozen should spend the remainder of their days in prison rather than fifty times as many should perish in forest fires and a hundred times as many be left in a state of ruin.

Hard To Learn a Lesson.

"Toronto Daily Star," Aug. 12, 1916: We need men who will handle the fire danger in New Ontario—men who will say that such disasters as those of 1911 and 1916 can be prevented and must be prevented.

In Periods of Drought.

St. Catharines "Journal," Aug. 5, 1916: Ontario, particularly in the Northern Clay Belt, has practically no ranger patrol, carries on no preventive campaign, and offers no opposition to the wholesale use of fire by settlers for clearing their soil of tree growth.

The "Blessings" of Fire.

"Christian Guardian," Aug. 9, 1916: We agree with the Canadian Forestry Association that it is foolish to speak of the blessings of the recent disastrous Northern Ontario fires. The loss resulting from such a fire is a very serious one indeed, and, say what you will, it is a preventable loss. Stricter regulations as to settlers' fires such as prevail in other parts of Canada would help a great deal. Why Ontario does not adopt such regulations is difficult to understand.

Give the Association a helping hand to pass the 4.000 mark before midsummer.

Liberty of Settlers.

Stratford "Beacon," Aug. 5, 1916: The recent forest fires in Ontario have brought out the inadequacy of the present system very clearly. Settlers are apparently at liberty to burn slash without any special restriction being put upon them, whereas in the Province of Quebec, in British Columbia and in several States of the Union, a license must first be obtained before such fires are set out. The result is seen in the freedom from forest fires of these States and Provinces. What has been destroyed would pay the cost of an army of rangers and inspectors.

The North Land's Reputation.

"Toronto Daily Star," Aug. 1, 1916: The great fire in the north country will have the effect of injuring the reputation of that region unless the Government can take such measures as will make it reasonably certain that similar disastrous fires cannot again occur.

What About the Next Forest Fire?

"Ottawa Evening Journal," Aug. 12: What guarantee will be given by the Ontario Government that 1917 or 1918 or any future year of great drought will not repeat the unspeakable horrors which have just been enacted in the north? Above and beyond every other question, that one must be answered before the confidence of the settlers in the Clay Belt can be restored.

No settler should be allowed to start a clearing fire between April and November without a permit from a qualified ranger.

One Real Benefit.

Montreal "Financial Times," Aug. 5, 1916: The disaster will not have been wholly in vain if it results in a determination on the part of Canadians to engage in conservation work for the prevention and limitation of forest fires upon an unprecedented scale and with unheard-of energy.

Repetition Unnecessary.

Kingston "Whig," Aug. 3, 1916: According to A. C. Clark, a manufacturer of lumber and wholesale dealer in it, the Ontario Government is largely to blame for the holocaust which has recently swept over Northern Ontario. Mr. Clark said that educative campaigns should be conducted among the settlers in these regions. The government is busy in carrying relief to the settlers. The point is that it must get busy in another way and by its vigilance guard against a repetition of the disaster.

Detect the Fire Early.

Cobourg "World," Aug. 4, 1916: It is evident that some system will have to be established whereby to detect and to fight forest fires before they assume dangerous proportions. The resources of civilization must be put under levy to protect the settlements.

Opinion in Dundas.

Dundas "Star," Aug. 3: No man cares to take up land and make improvements while constantly under the risk of having everything swept away without a moment's notice.

There will always be forest fires so long as the work of prevention is left in incompetent hands.

The Canadian Forestry Association

(Seventeenth Year)

119 Booth Building, Ottawa, Can.

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