

# Canadian Forestry Journal

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No. 6

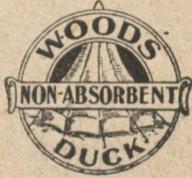


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# Canadian Forestry Journal

CIRCULATION 6500 COPIES MONTHLY

Vol. XIV.

WOODSTOCK ONT., JUNE, 1918

No. 6

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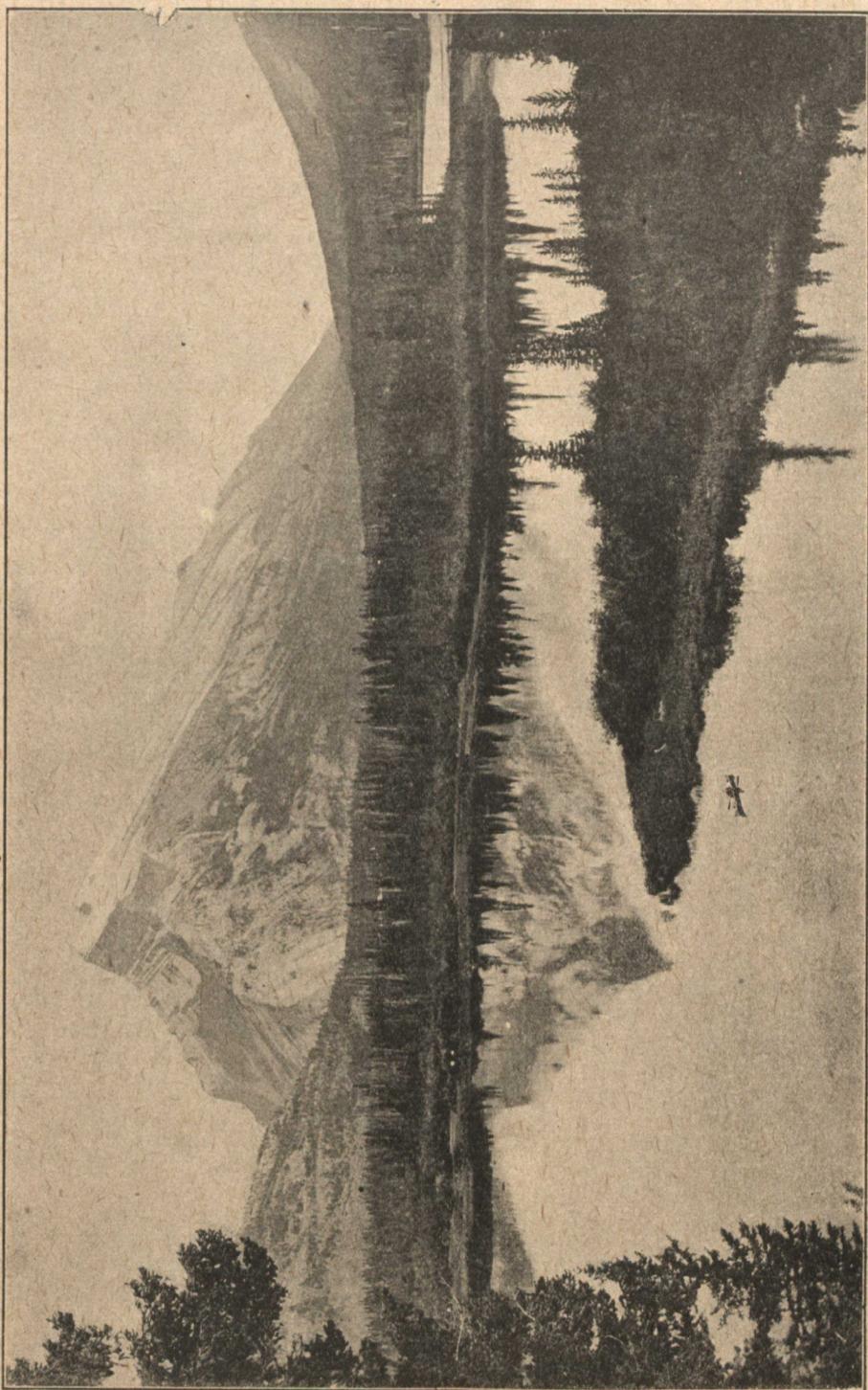
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CONSOLATION VALLEY AND MOUNT TEMPLE, LAGGAN, ROCKY MOUNTAIN PARK



REFLECTION OF MOUNT RUNDLE IN VERMILION LAKES.

## Claybelt Settlers Join Hands With Rangers

The people of Ontario, whose concern over forest fires was greatly stimulated by the 1916 Claybelt disaster, may rest assured that the present efficiency of the Forest Protection Service bears a cheering comparison to that of previous years. The building up of a protective service is no small undertaking and there remains much to be done before the machine can be said to be complete, but the procedure of the Department of Lands and Forests has been along right lines and the results are bound to give general satisfaction.

The Secretary of the Canadian Forestry Association recently covered part of the territory in the heart of the district that gave greatest trouble in 1916—Matheson, Porquis Junction, Iroquois Falls, Cochrane, and Hearst. This is now well organized under a very competent superintendent, Mr. E. R. Poole of Cochrane, who has equipped his division with lookout towers, canoes, speeders and other aids in travel and observation. Perhaps the most heartening conclusion in one's visit to the Cochrane district is that settlers are co-operating with the rangers in safeguarding their land-clearing fires. A very few summonses were issued as a guarantee of the Government's sincerity in applying the permit law. With that as a reminder, the rangers proceeded in their work with a maximum of tact and consideration, realizing that the control of settlers in an unorganized country is a most difficult proposition and that unless their goodwill is gained the issue of permits and control of fires becomes practically impossible. For that reason, the personal qualification of the rangers assumes first importance. No man should be retained in the Service who bullyrags or antagonizes the decent settler or tries to tie him up with red tape. The importance of the district superintendent's duties cannot be over-

emphasized, for it is he who knows his settlers personally and knows the way they should be handled. For the same reason, there can be no cast-iron rules fastened upon all parts of the forested region, for what will suffice with one district and one class of settlers is not precisely applicable to other conditions.

In the Cochrane district very little trouble with settlers fires has been experienced. Permits are being applied for regularly and the Forest Fires Act is taken with due seriousness. High prices of pulpwood, of course, act as a further damper to needless destruction. The soldier colony at Kapuskasing appears to be a model in its observance of the Fire Laws and in all the heavy burning this year on soldiers' lots, normal precautions have been taken and the ranger's advice sought on many occasions.

### WASTED WOOD IN B. C.

The indiscriminate cutting of convenient shore timber by hand-loggers in British Columbia results in the injury of many good logging sites; for, as the hand-loggers are not allowed to use steam power, they fail to get to the water a large proportion of the trees they cut down. It is estimated that at least 40 per cent. of the trees cut by hand-loggers are wasted in this way," says a pamphlet on "Forest Resources in British Columbia," issued by the Commission of Conservation.

"Since these workings are nearly always situated at the foot of a mountain and at the water's edge, where a destructive fire is most likely to start and gain headway, the resulting debris products a fire menace of the worst kind.

"It is extremely doubtful whether the advantages gained in forest utilization by this means, or the

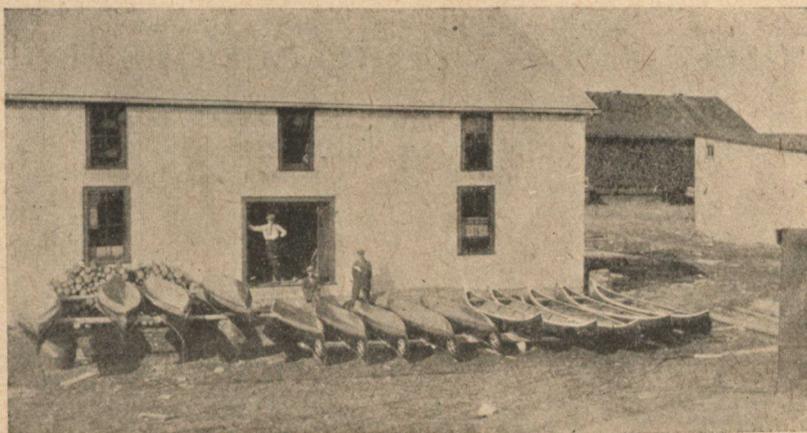
furnishing of employment to the nomadic, irresponsible men who follow the occupation of hand-logging are commensurate with the resultant damage. Though the discontinuance of hand-loggers' licenses was recommended by the British

Columbia Forestry Commission in 1910, they are still issued.

"During the last 28 years, hand-loggers have destroyed the timber on over 1000 miles of shore line extending back from 100 to 1300 feet, and covering an area of 50,000 acres."



A Big Fire but a useful one. Burning off a Settler's Slash in the Cochrane Division, Ontario. The slash is well piled, and plenty of watchers are on hand.



Up-to-date Outfit of the Ontario Forest Protection Service at Cochrane. Some of the Canoes Ready for Shipment to Rangers.

## The Mill and the Farmer in Northern Ontario

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Ontario's Claybelt area between the Quebec border and Hearst, along the National Transcontinental Railway offers one of the best possible illustrations of a working partnership between the forest and the farm. The lands are heavily covered with spruce and balsam and poplar, spruce running as high as 80 to 90 per cent. of the stand. The newly-arrived farmer must clear his lands of the tree growth as a preliminary to field crops. In his first two years he cannot hope to open up enough soil to give him a profit, but with the aid of the pulpwood selling at the track for \$7 and \$7.50 a cord (un-rossed), he can manage to make satisfactory wages while clearing his property. It is, therefore, contrary to the settlers' financial interests that the forest materials should be wasted in the clearing process through wholesale conflagrations. A much more potent argument against destructive fires is the necessity of having in the Claybelt country industrial towns to furnish a market for farm products (including pulpwood) and to provide periodical employment. Such

a combination is seen at Iroquois Falls, where the Abitibi Power and Paper Company has a pay list of \$110,000 a month and will buy every pound of farm produce raised in the surrounding country for many years to come. Results of the same nature will follow the new pulp mill at Kapuskasing, to be erected by the Spruce Falls Pulp and Paper Company, of which Mr. E. Stewart, Toronto, (former Director of Forestry) is Managing Director. This plant will create an industrial town on the C. G. R. at one edge of the soldiers' settlement. It will provide not only a centre of employment and immediate buyer for settlers' wood, but will make a produce market in which every soldier-settler can dispose of his goods at the best prices. The location of these mills in the spruce-covered Claybelt supplements in a most valuable manner the cause of settlement. There appears to be plenty of spruce to keep the mills supplied with raw material, if forest fires are suppressed with every means in the power of the Forest Service.

## Forest Fires Taking Serious Toll

### Outbreaks in Nova Scotia and New Brunswick Result in Substantial Losses

---

Forest fires have caused large losses during May and June. New Brunswick and Nova Scotia have suffered forest damages that will probably prove the heaviest for many years past.

Nova Scotia, which has enjoyed recent immunity from serious fire trouble, has been obliged to witness the destruction of substantial tracts of badly-needed timber and the burning

of improved property which in the total will form a large sum. Complete reports of the Nova Scotia fires have not reached Halifax at the time this issue of the Forestry Journal goes to press. Newspaper reports, however, and some private information show that the series of fires during June placed a severe test upon the Nova Scotia system, and may cause some revision of

present arrangements in order to combat future outbreaks. Nova Scotia experienced a very dry May and during the month of June had only one good rain, so that grass land was rapidly going back and pasturage for cattle was becoming a real problem.

The Windsor, N. S. Tribune of Friday, May 24th, reports several devastating fires in Hants and other counties, over which the flames, according to this newspaper, had been raging for ten days.

The Amherst Daily News of May 11th stated that a brush fire at Oxford Junction had caused loss of \$50,000 to cut timber alone.

Another despatch from Windsor, N.S., dated May 20th, asserts that the damage in Hants County from

forest fire destruction is estimated at over \$200,000.

The Anglican Church and hall at Queensport, near Guysboro, N.S., were destroyed and in the vicinity many houses and barns were burned. Other forest fires were reported from the vicinity of Annapolis. On May 18th raging fires were visible within a short distance of Halifax. A special report to the Forestry Journal declares that as a consequence of fires started by engines on a logging railway one lumber company lost \$6,000 in standing timber. The same fire spread to adjoining lands causing a similar loss and necessitated the cutting at once of a tract of hemlock.

Calls for military help were sent to Halifax and the prompt response greatly assisted in limiting the zone of damage.

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## *Trouble in New Brunswick*

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In New Brunswick, according to a statement issued by the Department of Lands and Mines, the two chief forest fires to the end of May did damage to the extent of nearly \$60,000. The fire on the Sinclair limits in Northumberland County, resulted in about \$40,000 damage, which was principally to the supplies and warehouses of the Sinclair Lumber Company. The fire at Maltais Stream between Kedgewick and Anderson, in Restigouche county, burned pulpwood and railway ties to the extent of about fifteen thousand dollars.

The section in Restigouche county where the fire broke out early in the week, is the most important Crown Land section in the province, and if the fire had not been put under control, it would have been the most serious loss that ever happened to the Crown Lands of the province. It was in the vicinity of Grimmer and Hazen Settlements.

Chief Forester Prince directed the fire fighting at Sinclair limits, forty

miles from Doaktown. He left Fredericton Saturday by automobile and after driving all night and most of the next day, struck into the forest on Sunday night. His assistants started in with one hundred men on Monday to fight the fire, and at about 11 o'clock the rain came on.

The Department at Fredericton also received reports to the effect that serious fires were raging along the International Railway in Restigouche County, but that these had been placed under control by the Forest Service.

On account of the lack of rolling stock, enormous quantities of railway ties, pulpwood and telegraph poles are piled along the International Railway which now is operated by the Canadian Government Railways, awaiting shipment, and a forest fire, should it gain headway at almost any point along the railway, would cause huge financial loss. The fire reported to the Department was in piles of manufactured lumber. It was between Kedg-

wick and Anderson stations and near Hazen, Grimmer and Stewart Settlements. In the event of a big forest fire in that section there would be loss of human life without much doubt and destruction of large areas of the most valuable timber land in the province.

The New Brunswick fires came as a surprise to those who were aware that the weather in New Brunswick this season had been anything but favorable to forest fires; in fact until the outbreak mentioned above only a few trifling fires had been reported. The Department of Lands and Mines is sending out numerous placards warning fisherman, hunters, lumbermen and others having occasion to go into the woods, to be careful in lighting and in extinguishing camp fires, and in the use of matches. These placards are being posted in conspicuous places in the woods by fire wardens, game wardens and others. Other fire preventive measures will be adopted as soon as the new regulations passed at the last session of the legislature are brought into effect.

#### *Campers Caused These Losses.*

According to the Department of Lands and Mines *three of the fires which have caused most anxiety this year were traced definitely to unextinguished camp fires.* For example, a fire near Eel River, York County, was started by people who had gone into the country for a Sunday picnic and had lighted a fire for their mid-day meal. They packed camp without taking the precaution to put out the fire with the result of a very heavy loss to the public treasury. Two other fires in succession were reported as being due to exactly the same cause.

The trouble experienced in New Brunswick this year cannot be regarded as offering any comment upon the efficiency of the new Forest Service. The organization remains practically the same as last year inasmuch as the Act creating the Forest Service and arranging for the improvement in its machinery and personnel went into effect only re-

cently and the administrative commission has just held its first meeting.

According to the Pulp and Paper Magazine a forest fire on the Picauga River near Chicoutimi, Quebec, communicated itself to the provision stores of Price Bros., Limited, causing a loss of \$25,000. A despatch from St. Johns, Nfld., declares that a fierce forest fire broke out at Gambo on May 22nd, destroying a considerable amount of growing timber.

#### *Fishermen and Pioneers*

Fredericton, June 9.—Fishermen and picnickers are assigned by the Department of Lands and Mines as the cause of the fires which have done considerable damage in the forests of New Brunswick already this season. The greatest damage and the largest number of fires, occurred this week and followed directly after June 3, the King's birthday, which was observed generally as a holiday. In several cases fires were traced directly to fires started by pleasure parties for the preparation of food and imperfectly extinguished or not put out at all.

In practically all cases of fires starting in the woods they have been caused by inexperienced persons. In no cases have men whose business takes them into the forests started fires in the woods which have damaged standing timber. There is less excuse for pleasure parties causing fires this year than ever before, for press notices and slides at the picture houses and posted notices have warned most persons of the danger of forest fires.

#### **CREDIT TO THE COMMISSION**

Some recent descriptions of the establishment of the Forest Products Laboratories at Vancouver, to be engaged in the solution of the special problems relating to British Columbia woods, have unintentionally omitted the important fact that the agitation for these laboratories was instituted by the Commission of Conservation which has shown great energy in promoting the idea through all its stages.

## Machine Guns or Forest Fires

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If Canada presented Germany with one hundred machine guns, the Government responsible for the act would not only be deposed but thrown into prison.

Any weakening of Canada's natural resources is equivalent to direct gift to the Teuton adversary. It adds to our handicaps and to his relative advantages. It saps this country's power to bear up in time of war and during the trade struggle of peace times, for the natural resources are the great keystones on which the national arch depends.

To have our forests burn down by wanton acts of our own population is quite as pleasing to the Hun as to send paid bombers into our munition plants.

To see the national strength reduced by stingy fire protection serves the German aim quite as handily as to submarine our ships.

If German forests were disappearing as fast as our own, some sense of military satisfaction might be felt at the present time. But such is not the case.

In Saxony, with 435,000 acres of forests, the loss from fire is rarely more than \$300 per annum. Wurttemberg, with 418,000 acres of forest losses about \$650 per annum. The Duchy of Baden, with 240,000 acres had only 99 acres burned in nine years. Thus, on about 1328 square miles of German forest, the loss runs about \$950 a year. Similar figures apply to other German forest areas.

Canada, of course, cannot hope to establish conditions of forest management analogous to those of Germany, and the fire hazard will long remain alarmingly high, certainly until the great peril of logging slash is thoroughly removed. But even with all allowances for our peculiar situation in which all steps towards conservation must be gauged by the likelihood of immediate profit in terms of cash, Canada's forest fire losses remain out of all proportion to our "irreducible minimum."

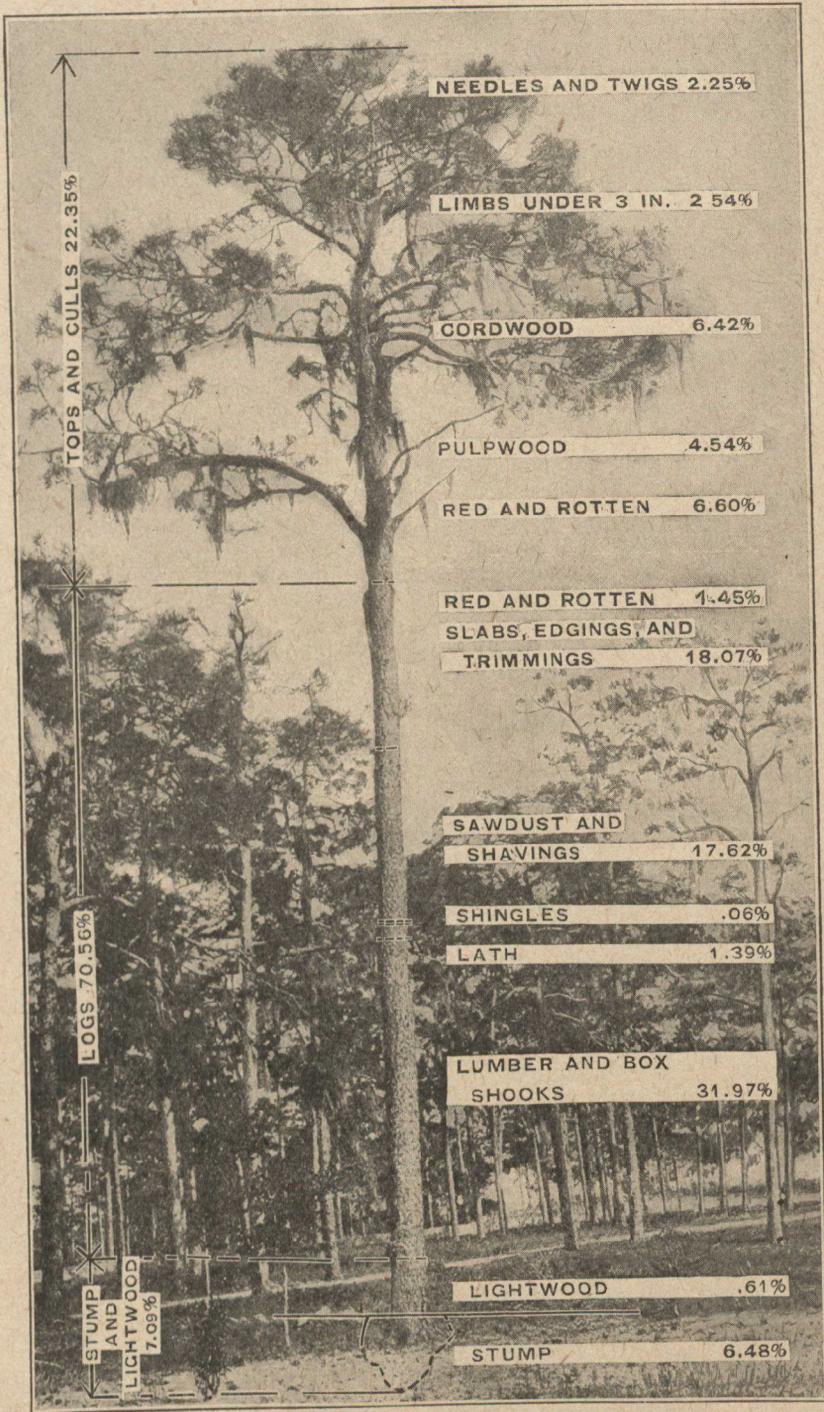
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## Farm Fertility Needs Tree Protection

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Addressing the York Pioneers Club at Toronto, Mr. Charles W. Nash, an Englishman who came to Canada many years ago from the agricultural county of Sussex, gave his audience the benefit of his observations of the contrast of results obtained in conservation of fertility of the soil in Canada and Great Britain. The 40 and 45 bushel crops of wheat, which were general throughout York County when he first knew it are now the exception, he said, and he quoted Government statistics, showing that the average yield of wheat for the county in 1917 was 25 bushels, a figure which was below the average for the past 16 years, however, by eleven bushels. The average yield for the Province of Ontario was only 28 bushels of wheat and in this and

other grain crops, York County has for years exceeded the average of the province. The average yields for the county and province respectively being as follows: Oats, 46-40; Barley, 36-33; Rye, 17-16; Peas, 18-16; Corn, 50-44. As one reason for the falling off in productivity of the soil in York, and in the province in general, Mr. Nash gave the too extensive removal of the forest, an opinion in which he is endorsed by many farmers of long practical experience. Not only does this removal of the forest leave the cultivated land too greatly exposed, locally, but where the tree growth is entirely removed from the location of the source of streams the results are disastrous to a regular and sufficient supply of water through the country-side.



Messrs. Arthur D. Little, Limited, of Cambridge, Mass., who have favored the Forestry Journal with the above illustration state that two thirds of a long leaf pine tree is discarded as waste and that only one third actually becomes merchandise.

## Forestry Course for Returned Soldiers

Commencing March 25, a four weeks' course in forestry for returned veterans who desire to qualify as forest guards was opened in Vancouver under the auspices of the Vocational Branch of the Military Hospitals Commission, the classes being intended to serve students from the four western provinces. It was stipulated that men enrolling should be in fairly good physical condition, have a fair education, and possess previous experience as lumbermen, loggers, trappers or ranchers. The course of instruction will cover lectures, demonstrations and field work on the subjects noted below:

1. Elementary Forest Survey—(a) Use of instruments; (b) system of land surveys; (c) mapping.

2. Forest Protection—(a) Fire prevention; (b) fire detection; (c) fire fighting; (d) fire laws.

3. Forest Management—(a) Nature of forest; (b) identification of tree species; (c) principles of administration.

The following well-known forest engineers and professors have been engaged as instructors: H. R. Mac-Millan, M.S.F., assistant director of aeronautical supplies, Imperial Munitions Board; Judson Clark, Ph.D., forest engineer; P. L. Lyford, forest engineer; R. D. Craig, M.S.F., district inspector, Imperial Ministry of Munitions; E. H. Finlayson, B.S.F., inspector of Dominion forest reserves, Alberta; D. R. Cameron, B.A., B.S.F., inspector of Dominion forest reserves, British Columbia; W. J. VanDusen, B.S.F., district forester; Professor MacLean, University of British Columbia; J. Davidson, University of British Columbia, and Mr. Lighthall of the B.C. University, who is also Dominion land surveyor.

### A NATIONAL WARNING

Canada will pay her war debt from her productive Lands and Forests and Mines.

The Fire Fiend, who is the Kaiser's ally, is scheming to finish the Forests

first. He can't kill the Land or Mines, but the Forest is his natural prey.

Are you aiding the Fire Fiend this year? If not, put out your camp-fire, lighted match and cigarette.

Millions of acres in Canada are growing excellent timber. New industries are coming to use that timber. Thousands of workmen will be given good jobs.

But we cannot have both the industries and FOREST FIRES. One kills the other.

Forest fires are preventable. Put out your camp fire, lighted match or cigarette when in the bush.

### SETTLING SOLDIERS

In many of the schemes of soldier settlement and the encouragement of immigration after the war, there appears for almost the first time some concern for the quality of the land, on which homesteading shall be permitted. We may read in this some hope that examination of soil in advance of settlement may reduce the amazing evils consequent upon indiscriminate "locating." Canadians, as a rule, have been slow to recognize that the normal, profitable crop on most non-agricultural soils is timber and that the bitterest experience a government can visit upon a farmer is to establish him in defiance of Nature's fundamental laws. One of the primary duties of the Soldiers' Settlement Board will be to guard the soldier-settler from the pitiful consequences of a bad location. If areas are hastily thrown open without thorough examination by foresters and soil experts, whose advice will be accepted as final, the efforts of the Board will prove worse than useless. It will be a matter of great interest to the Forestry Association and its members to follow the work of the Board and ascertain how far scientific guidance in the selection of lands for veterans is allowed to dominate.

## *The Poet's Reading of the Trees*

### THE HAWTHORNE-TREE

By Siegfried Sassoon

Not much to me is yonder lane  
Where I go every day;  
But when there's been a shower of rain  
And hedge-birds whistle gay,  
I know my lad that's out in France  
With fearsome things to see  
Would give his eyes for just one glance  
At our white hawthorne-tree.

Not much to me is yonder lane  
Where he so longs to tread:  
But when there's been a shower of rain  
I think I'll never weep again  
Until I've heard he's dead.

### THE STILL TREES

By John Russell McCarthy

I thank you, Elm and Beech and all my  
friends  
That live so wisely on the happy hills,  
I thank you for your silence. Even a friend  
(Especially a friend) must have his moods,  
His long still days of dreaming silence spent  
In strange communion with his soul and  
God.

And you, my friends, have chosen for your  
silence  
The slow lean months of winter. All the  
burdens  
And all the joys of this embattled earth  
You dare forget, so that your soul and God  
May have their hour of studious solitude.

So I, O friends, who walk among you now,  
Go searching inward to the soul in me,  
And bend my dreams unto the God we  
know  
I thank you, Elm and Beech and all my  
friends  
That live so wisely on the happy hills.

### THE POPLARS

By Theodosia Garrison

My poplars are like ladies trim  
Each conscious of her own estate;  
In costume somewhat over-prim,  
In manner cordially sedate,  
Like two old neighbors met to chat  
Beside my garden gate.

My stately old aristocrats—  
I fancy still their talk must be  
Of rose conserves and Persian cats,  
And lavender and Indian tea;  
I wonder sometimes as I pass  
If they approve of me.

I give them greeting night and morn,  
I like to think they answer, too,  
With that benign assurance born  
When youth gives age the reverence due,  
And bend their wise heads as I go  
As courteous ladies do.

Long may you stand before my door,  
Oh, kindly neighbors garbed in green,  
And bend with rustling welcome o'er  
The many friends who pass between;  
And where the little children play  
Look down with gracious mien.

### THE LONELY TREE

By Wilfred Wilson Gibson

A twisted ash, a ragged fir,  
A silver birch with leaves astir.

Men talk of forests broad and deep,  
Where summer long the shadows sleep.

Tho' I love forests deep and wide,  
The lone tree on the bare hillside,

The brave, wind-beaten, lonely tree  
Is rooted in the heart of me.

A twisted ash, a ragged fir,  
A silver birch with leaves astir.



In the Forests of Finland: Scotch Pine Crown Forest at Evois, Finland, 95 years old.

## Finland's Public-owned Forests

BY SAMUEL T. DANA.

**Amazingly Low Fire Losses and High  
Income to State; 180 Foresters Employed.**

Finland, with a total forest area variously estimated at from one-half to two-thirds of its total land area, probably has a larger proportion of forest area than any other country in the world. Of this forest area considerably more than half is owned by the State. According to recently published official statistics the area of these State forests in 1912 was as follows:

	Per cent.	Area (acres).
Cultivated lands .....	.56	174,000
Productive (dry) forest land .....	42.67	13,295,000
Unreclaimable swamp and marsh land .....	53.00	16,516,000
Water .....	3.77	1,176,000
	100.00	31,161,000

The small per cent. of cultivated land and the large per cent. of unreclaimable swamp and marsh land are particularly noteworthy. Of the total

area of 31,000,000 acres included in the State forests, only a little more than two-fifths consists of productive forest land, which is even less than the proportion of productive forest lands in the National Forests of the United States. The bulk of the State forests are in the northern part of Finland and consist largely of protection forests interspersed with extensive areas of barren land. In the very northernmost part of the country nearly 8,000,000 acres have been set apart as protection forest, of which only 3 per cent. is private land. Since the management of this protection forest must be particularly careful and financial returns correspondingly low, this district is left out of consideration in calculations of future incomes from the State forests.

The State forests consist mainly of land which has always belonged to the government, or in earlier times to the Crown. The policy of increasing this area by purchase was, however, adopted in 1874, and considerable areas were secured up to 1895, when the policy was abandoned. In 1906 purchases by the State were resumed, and from then to 1912, 39,809 acres were purchased for \$204,025 (\$5.13 per acre). During recent years an annual appropriation of about \$39,600 has been made for this purpose. While these purchases are small in comparison with the total area of the State forests, they are nevertheless significant as an indication of the well-established policy of Finland not only to retain forest lands already in the possession of the State, but to add to these as circumstances make it possible.

#### *A Land of Small Trees*

As would naturally be expected in a country lying as far north as Finland, the individual trees are comparatively small and slow-growing, with only a few large trees per acre. Reconnaissance estimates show that on the State forests there are approximately 141,000,000 trees of merchantable size, divided into two classes:

10 to 12 inches d.b.h., 82,629,004 trees  
Over 12 inches d.b.h., 58,781,445 trees

The fact that this apparently large

number of trees does not indicate a heavy stand is evident, when it is remembered that these represent only 10.6 trees per acre of productive forest land, or 4.8 trees per acre of total forest-bearing land. The stand per acre of productive forest land varies from 486 cubic feet in parts of the extreme north to 2,002 cubic feet in the south. In general, the stand averages about 715 cubic feet per acre in northern Finland and twice as much, or 1,430 cubic feet per acre, in southern Finland. It is interesting to note that in some cases the stand on dry forest land is considerably more than on unreclaimable swamp land. This is particularly the case with Norway spruce, and is due to the fact that large areas of spruce swamp still remain untouched as a result of poor markets for the smaller-sized material.

The timber-sale business in the Finnish State forests is well developed. In 1911 forest products to the value of \$2,495,200 were sold, of which 85 per cent. was saw timber. This is a marked increase over the timber-sale receipts of \$1,401,000 in 1905, which at that time was reported to be the maximum ever received in one year. The total amount of the cut in 1912 was 86,202,000 cubic feet, or 6.43 cubic feet per acre of productive forest land. This is believed to be considerably less than the annual growth. The highest cut was, as might be expected, in the southern part of the country, where on one forest it averaged 64.35 cubic feet per acre. In comparison with the United States, it is interesting to note that the amount cut under timber sales on the National Forests in this country for the same year amounted to 431,492,000 board feet (possibly 86,300,000 cubic feet) and yielded \$942,819. It should be remembered, however, that in the United States these figures refer to stumpage value only, while in Finland most of the timber is cut by the government and sold in the form of logs.

#### *Sale by Auction*

The bulk of the sales are carried on by general auctions, at which the timber is disposed of to the highest

bidder above a certain minimum price. In 1912, 2,465,430 saw-timber trees (10 inches and over in diameter breast high) were offered for sale at such auctions, together with considerable tie material and firewood. The trees are ordinarily sold in the form of single logs, and the average price per log was 83 cents, varying from 12 cents to \$1.93. Because of low bids about 630,165 stems were left unsold. Of the material put up at auction, 76.6 per cent. was Scotch pine and 23.4 Norway spruce.

Considerable smaller saw timber, tie material, and firewood are also offered for sale at smaller local auctions. In 1912, for instance, products valued at \$229,724 were disposed of in this way. These auctions are constantly increasing in popularity and importance, as is seen from the fact that while they were held in only three of the State forests in 1904, they were held in 45 in 1912. The chief purchasers at such auctions are now sawmills, which some ten years ago had practically no interest in them.

#### *Small Fire Losses*

For so large and comparatively unsettled a forest area the extent of the fire damage is remarkably small. In 1912 only 991 acres were burned over at a loss of \$11,945 (\$12.05 per acre). This showing is particularly remarkable, when it is remembered that it is not so many years since reckless burning of the forests was the rule, and fires were frequently set in order to clear patches of land which were cultivated for a few years and then abandoned. Trespass occurred in 277 cases, but amounted to only \$1,732.

The State itself operates three sawmills. These at first were intended only for the utilization of such forest products as did not find purchasers in the general market and for the procuring of firewood for the State railways. They have, however, developed considerably, until now they are a source of more or less export material. In 1912, for instance, 2,000 standards were produced by these mills for export, and considerably

more in 1914. In addition to making possible the utilization of the more distant forests, these mills have proved of decided advantage in giving the government a clearer insight into conditions in the international timber market and a better grasp on the sawmill industry.

#### *Public Income*

The total income from the State forests in 1912 was \$2,726,853 and the net income \$1,692,039. This amounts to a net income of 12.7 cents and is certainly a creditable showing, when the poor growing conditions and comparative inaccessibility of much of the State forest areas are considered.

From 180 to 200 trained foresters are regularly employed, in addition to which there are a varying number of temporary appointments in the different forests. Technical forestry is now taught at the University of Helsingfors, where the course covers from three to four years.

#### **WALNUT NEEDED FOR ARMY**

Major E. A. Shepherd, of the Ordnance Department of the U. S. army, has sent the following letter to lumber manufacturers:

"The Ordnance Department and the Signal Corps of the United States army jointly request that you refrain for the duration of the war from the manufacture of veneer from walnut lumber, other than butts, crotches, or figured material, none of which walnut lumber is suitable for the manufacture of gun stocks or airplane propellers.

"The walnut lumber that enters into the manufacture of veneers, other than that above stated, is urgently needed at this time by the United States Government in the prosecution to a successful conclusion of the war which we are now waging against Germany. In other words, this lumber is a vital necessity for the manufacture of gun stocks and airplane propellers for the immediate equipment of our forces. It is requested, therefore, that you refrain from the manufacture of veneers, as stated above."

# The Status of Railway Fire Protection in Canada

BY CLYDE LEAVITT

*Chief Forester, Commission of Conservation, and Chief Fire Inspector,  
Railway Commission.*

From the viewpoint of fire protection, the steam railways of Canada, aggregating about 38,624 miles, may be classified under three general heads, according to their legal status:

1. Lines subject to the jurisdiction of the Board of Railway Commissioners for Canada.
2. The Government Railways System.
3. Provincially chartered railways.

## *Lines Subject to the Board*

The first class, comprising lines subject to the Railway Commission, totals some 32,389 miles, or nearly 84 per cent of the total. These are primarily lines which hold their charters from the Dominion Government or have been declared works for the general advantage of Canada. Included in this class are such companies or systems as the Canadian Pacific, Canadian Northern, Grand Trunk, Grand Trunk Pacific, Great Northern, Kettle Valley, Algoma Central and Hudson Bay, Atlantic, Quebec and Western, Quebec Oriental, Dominion Atlantic, Edmonton, Dunvegan and British Columbia, Esquimalt and Nanaimo, Halifax and South Western, Temiscouata, and a number of smaller lines too numerous to mention here.‡

The Canadian Northern System retains its status as a corporation, and remains subject to the jurisdiction of the Railway Commission, notwithstanding that the ownership

‡For complete list of these and other lines, revised to 1914, see *Forest Protection in Canada, 1913-1914*, pp. 10-15, published by the Commission of Conservation.

of its stock has been acquired by the Dominion Government. Thus, it is on an entirely different basis from the Canadian Government Railways proper.

The requirements of the Board relative to fire protection, applicable to lines under its jurisdiction, are briefly as follows:

(a) Rights of way must be maintained free from all unnecessary combustible matter.

(b) Efficient spark arrestors and other fire-protective appliances must be maintained on all coal-burning locomotives.

(c) The dumping of fire, live coals and ashes upon the right of way is prohibited, unless extinguished immediately.

(d) The use of lignite as locomotive fuel is prohibited, on account of fire danger from sparks.

(e) In prairie sections, the Chief Fire Inspector prescribes the plowing of fire guards.

(f) Officers of the Fire Inspection Department are authorized to prohibit the burning of debris upon the right of way during exceptionally dry periods.

(g) The Chief Fire Inspector is authorized to prescribe the establishment of special fire patrols by railway companies through forest sections.

(h) Railway companies are required to instruct sectionmen, agents, contractors, trainmen, and other regular employees, relative to the reporting and extinguishing of fires burning upon or near the right of way. The company is made responsible for the extinguishing of all fires occurring within 300 feet of the track, unless proof shall be fur-

nished that such fires were not caused by the railways.

(i) Each railway company is required to submit a report to the Board with respect to every fire which burns over more than 100 square feet outside the right of way in what is classified as a forest section. These reports are checked and supplemented by reports from officers of the Fire Inspection Department.

The fire protection work of the railway companies is supervised by the field staff of the Fire Inspection Department of the Board. This staff is not a special set of men employed by the Board, but is made up of employees of the various forestry and fire-protective organizations of the Dominion and provincial governments, each such organization working within its own territory, and each such employee being appointed an officer of the Board under a co-operative arrangement established immediately following the issuance of the Board's fire regulations in 1912. This plan has for the most part worked out admirably during the six and one-half seasons it has been in effect. The railway companies have, with few exceptions, co-operated efficiently, and the fire loss, due to railway causes, has decreased to such an extent that the railways now give promise of becoming minor instead of major agencies in causing loss by forest fires. In many cases, the railways have been effective in checking fires which came in from a distance, and for the origin of which they were in no wise responsible.

#### *Canadian Government Railways*

The Canadian Government Railways total some 4,565 miles, or nearly 12 per cent. of the total for Canada. Lines included in this system are the Intercolonial, National Transcontinental, New Brunswick, and Prince Edward Island, International of New Brunswick, Prince Edward Island, St. John Valley, Quebec and Saguenay, Elgin and Havelock, Moncton and Buctouche, St. Martins, York and Carleton,

and Salisbury and Albert. The acquisition of the last named line is effective July 1, and of the four preceding, June 1. Negotiations are still under way for the purchase of the Kent Northern and Caraquet and Gulf Shore, under recent legislation.

The Hudson Bay Railway, extending northeasterly from Pas, Manitoba, is still in the construction stage and is being operated by the contractors.

The question of fire protection along Government Railways has been a live issue for many years. In former years there was much criticism, and the matter has been subject of repeated representations by the Conservation Commission, Forestry Association, provincial governments, timber owners, and forest protective associations. The Department of Railways and Canals, which has the administration of these lines, has repeatedly pledged itself to the adoption of the same standards relative to fire protection as are in effect on lines under the jurisdiction of the Railway Commission.

Great improvement has unquestionably taken place during recent years. However, there seems only too good reasons, for the opinion that this work has not yet uniformly reached the standard set by the Board's regulations for lines under its jurisdiction. It is believed that so far as this deficiency exists, it is due rather to lack of special organization involving specialized overhead supervision and inspection, rather than to any lack of intent on the part of officials to maintain a uniformly high standard in the work of fire prevention and control. The usefulness of local specialized inspection in bringing about improved conditions with reference to fire prevention and control along Dominion chartered railways has been conclusively demonstrated through the Fire Inspection Department of the Railway Commission. This is quite natural, since railway employees, especially when there is a shortage of labor, may be expected to pay most attention to

work, failure to perform which would be most likely to cause them trouble. In this way, fire protection is likely to suffer unless some specialized inspection is provided to see that it gets its reasonably fair share of attention. The provision of such inspection by the Railway Commission has unquestionably supplemented to a very valuable degree, the ordinary supervision by railway officials, on Dominion chartered lines. There is, however, no legal provision for such outside or supplementary inspection, so far as the Government Railways are concerned.

To a certain extent, this deficiency has been overcome through the expenditure of money by private and provincial government agencies, co-operating with the Government Railways management. Failing adequate action by the Dominion Government, which should have set the pace for the privately-owned lines, instead of the reverse, it became imperative that limit-holders and provincial governments in eastern Canada should protect their valuable timber properties by themselves undertaking work, very largely at their own expense, which privately owned lines are required by the Dominion Government (through the Railway Commission) to perform without cost to timber owners and provincial governments. The inconsistency and unfairness of this attitude on the part of the Dominion Government are, of course, perfectly obvious.

Thus, we see, in Ontario, the provincial Forestry Branch maintaining fire patrols along the Transcontinental, only one-third of the cost being reimbursed by the Department of Railways and Canals. There is no provision for an outside inspection of fire-protective appliances on engines, which has proven itself so valuable on private lines in preventing the occurrence of fires. The report of the Provincial Forester for 1917 states that 60 per cent. of the railway fires in the province during that year occurred along the Transcontinental, where the worst conditions exist. This proportion is twice to three times as high as it

should be, considering the total mileage of other lines.

In Quebec, the situation is very much the same. On the Transcontinental west of Parent, a special patrol is maintained by the Forest Service. East of Parent the patrol north of the St. Lawrence is maintained by the St. Maurice Forest Protective Association, and on the south shore by the Southern St. Lawrence Forest Protective Association. The Dominion Government pays one-third the salaries of the fire rangers on this railway patrol, the balance being borne by the associations and the Provincial Government jointly. The Government Railways management also furnishes gasoline and oil for the power speeders used on this patrol, co-operates in keeping the speeders in repair and maintains a fire-fighting tank car at Monk station.

In New Brunswick, the provincial Forest Service maintains a power speeder patrol through Forest sections along the Transcontinental and International railways, the Government Railways management paying one-third the salaries of the fire rangers in question, and co-operating along much the same lines described above. In this province, a special inspector of fire protective appliances on engines is given qualified inspectors of the provincial Forest Service. In this respect, developments here are in advance of those in Ontario and Quebec.

It is, of course, understood that the Government Railways management issues the usual standard instructions to section men and other regular employees relative to extinguishing fires, and also that the special patrols above referred to are regarded as necessary to supplement whatever the section forces may be able to do in this direction.

In Nova Scotia, so far as known, there are no special co-operative arrangements, the railway and the province each handling its own fire protective work independently.

In Manitoba we have both extremes. On the Transcontinental, between Elma and the Ontario boundary, the Government Railways main-

tain a special power speeder patrol wholly at its own cost, permitting co-operative inspection of fire protection work by the Dominion Forestry Branch. On the Hudson Bay Railway, on the other hand, the necessary special patrol is maintained wholly at the expense of the Dominion Forestry Branch. This again exemplifies the inconsistency and unfairness of the existing fire protection situation on the Government Railways.

This whole matter, however, now bids fair to be straightened out in due course. At the 1917 session of Parliament, an amendment to the Government Railways Act passed the House, providing for placing the Government Railways under the jurisdiction of the Railway Commission with relation to matters in general, including fire protection. This bill, however, failed to receive consideration in the Senate, because it was contingent upon the enactment of the consolidation and revision of the General Railway Act (defining the jurisdiction of the Railway Commission as to privately-owned lines), which bill failed of consideration in the Senate at that session. During the 1918 session, the House and Senate failed to agree as to amendments to the consolidation and revision of the General Railway Act, and the question was not raised of amending the Government Railways Act to give the Board jurisdiction over the Government Railways. This matter has been strongly urged on grounds other than fire protection, and very likely will come up again.

More recently, the suggestion has been advanced that possibly the Government Railways might be amalgamated with the Canadian Northern and with other lines which the Government is considering taking over, including the Grand Trunk and the Grand Trunk Pacific; all to be managed as one system, on what would be practically a corporate basis, by a Board of Directors to be selected by the Government, presumably much along the lines already announced with reference to

the proposed management of the Canadian Northern System, the stock of which is now owned by the Dominion Government. Should this action be taken, and should the greatly enlarged Government Railways System be made subject to the jurisdiction of the Board of Railway Commissioners, as the Canadian Northern, Grand Trunk and Grand Trunk Pacific are now subject, the question of fire protection would automatically become solved, through the application, to what now comprises the Government Railways System, of the same regulations which are now applicable to the other lines over which the Board now has jurisdiction.

#### *Provincially Chartered Railways*

Fire protection upon provincially chartered railways has very largely ceased to be a serious problem, except in the province of Alberta. Here we have the Alberta Great Waterways and the Canada Central railways, still in the construction stage and aggregating some 350 miles of track. The Dominion Government has no jurisdiction over such railways, except as to lines in forest reserves, and there is no provision in the provincial legislation for the enforced adoption of preventive measures. Consequently, the Dominion Forestry Branch is left to take what measures it sees fit, at its own expense, supplemented by whatever action the Companies may see fit to take voluntarily. The Commission of Conservation, the Canadian Forestry Association and the Department of the Interior have made urgent representations to the Alberta Government to have this condition corrected, on a basis consistent with what is being done elsewhere.

In British Columbia, the provincial Forest Service has practically the same authority as to fire protection on provincial railways that the Railway Commission has as to Dominion chartered lines. Only small and relatively unimportant lines come under this category. The Pacific Great Eastern has now been taken over by the province.

In Ontario, similarly, the mileage of provincially chartered railways is small, and the legislative provision for their control is adequate, being administered by the Forestry Branch Department of Lands, Forests and Mines. The Temiskaming and Northern Ontario Railway has much the same status provincially that the Canadian Government Railways have from a Dominion viewpoint, being owned by the province and operated by a commission. This commission reimburses the Department of lands, Forests and Mines for one-half the cost of the special fire patrol maintained along this railway by the Forestry Branch.

In Quebec, the only provincially chartered railway of any consequence from fire protection viewpoint is the Quebec Central. The Quebec Public Utilities Commission has fire regulations parallel to those of the Dominion Railway Commission, and the Provincial Forester acts as an officer of this Commission in enforcing these regulations.

In New Brunswick, the recent absorption of several small lines into the Government Railways system has very nearly removed the problem of provincial railways from further consideration. However, a few small and unimportant lines remain, and fire protection on such is thoroughly provided for under the new Forest Fires Act of 1918, which is administered by the Provincial Forester.

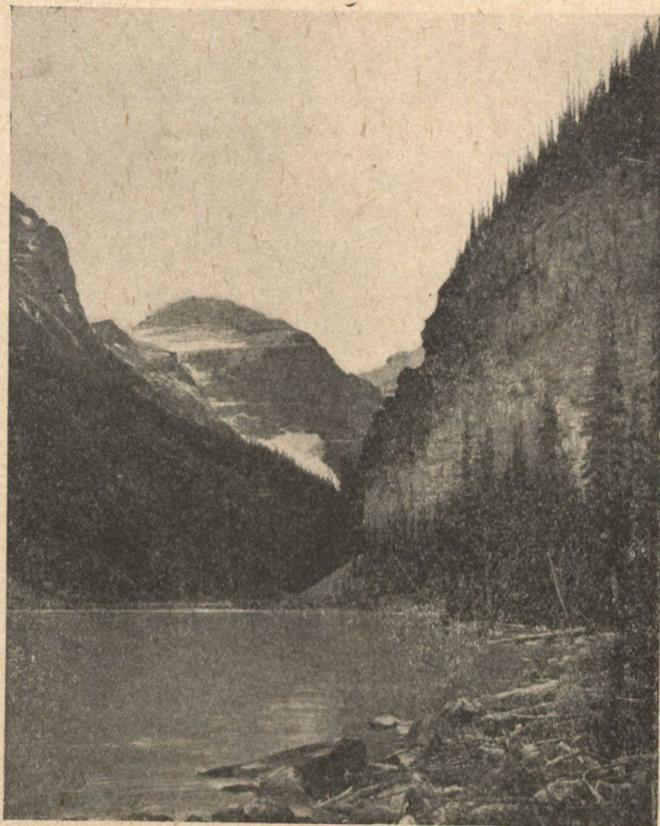
Nova Scotia has of provincially chartered railways only the Cape Breton, Sydney and Louisburg, and Maritime Railway, Coal and Power Co. Provincial legislation is adequate as to fire protective appliances on locomotives and as to right of way clearing. There does not, however, appear to be provision for enforced patrol by railway companies or fixing responsibility on railways for extinguishing fires due to railway causes.

Prince Edward Island, Saskatchewan and Manitoba have no provincially chartered railways in operation.



#### Clearing Land Without Destroying Adjacent Timber

The lower picture shows the slash resulting from clearing operations, the upper the same area after the slash has been burned under permit from the Ontario Forestry Branch. Precautions were taken which have preserved from destruction the adjoining valuable pulpwood forest. At present prices for pulpwood, settlers in forest sections possess an extremely valuable resource in the timber on their lands.



MOUNT LEFROY, LAKE LOUISE.

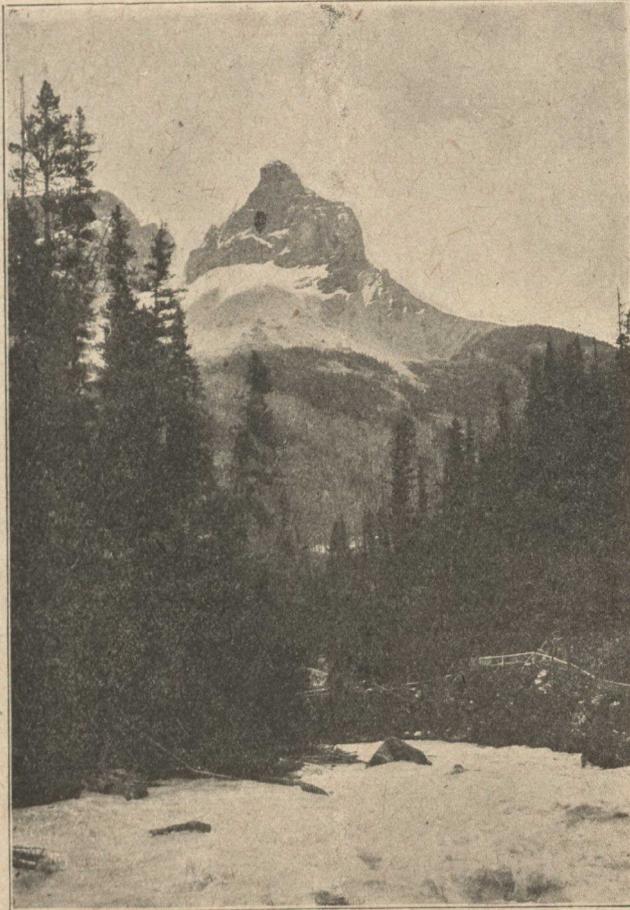
## War Record of Dr. Fernow's Students

The Faculty of Forestry (Dr. B. E. Fernow, Dean) during the past session has managed to "carry on" with the teaching staff reduced by about 50 per cent, and the enrolment of students to the same number as the previous year, namely ten, four of them in the fourth year, all unfit for military service, and five in the first year, too young for enlistment until the end of the session, when two of them had reached the proper age.

Professor W. N. Millar of the staff, being a citizen of the United States, enlisted immediately after the declaration of war by that country, joined the tenth Engineers (Forest) Battalion as captain, and is in France directing a logging operation. Prof.

J. H. White of the staff has accepted employment with the provincial government as assistant to Mr. Zavitz, Provincial Forester, with leave to continue his lecture work in part. A thorough re-organization of the fire protective service has been the main work of his department. Dr. Howe of the staff continues this summer his investigation for the Commission of Conservation into the reproduction of cut-over pulpwood lands and is also superintending the establishment of permanent sample plots on which the development of young tree crops, rate of growth, etc., can be studied in detail from period to period. In this work several of the students are employed.

Another set of students is employed



CATHEDRAL PEAK, YOHO.

under the Dominion Forestry Branch in the survey of the Petawawa military reservation, which is to be used as a forest experiment station. This party is under the immediate direction of Mr. R. A. Courtnage, one of this year's graduates. Mr. Courtnage enlisted at the beginning of the war in the aviation corps, but while flying in England came to grief in a collision and broke both legs. Apparently the fractures have been so successfully healed that no difficulties are experienced in the field work.

Among the men returned from the front, we should mention Mr. E. G. McDougall (B. Sc. F. '11), who unfortunately lost one leg, but who has found acceptable employment in

the Weather Bureau. Capt. A. E. Parlow (B. Sc. F. '13), who has been three years at the front and has been wounded several times, has returned honorably discharged, to assume his work with the Dominion Forestry Branch in British Columbia. Several other men have returned but are not yet physically in condition to take up the work of their chosen profession.

It might be supposed that the majority of forestry students had enlisted in the forestry battalions, but this is not the case. Out of the 80 men at one time enrolled in the Faculty, who are enlisted, 31 being graduates, only 13 are to be found in these battalions. Two of our students, one a graduate, have at-

tained to the position of major, five to that of captain, and 43 to that of lieutenant. Eighteen have been wounded, gassed, or otherwise incapacitated. Six have been decorated with the military cross or medal, three mentioned for bravery, and the following have given their life for their country;

James Douglas Aiken, graduate 1916.

Charles Laidlaw Anderson, 1918.

George Edward Bothwell, graduate 1913.

Robert Alexander Rankine Campbell, 1915.

Albert Edward Cuzner, 1918.

James Russell Chamberlin, graduate 1914.

Kenneth Brown Downie, 1918.

Harold Sylvester Edmonds, 1918.

Alister Munro MacKenzie, 1913.

Ronald Mackenzie Richards, 1916.

Frederic Gustavus Stupart, 1918.

Arnold Monroe Thurston, 1916.

John Archibald Trebilcock, graduate 1915.

The work of the Faculty is to be kept up through the coming session as usual, and a number of discharged soldiers expect to enrol. Meanwhile, the Khaki University also proposes to start forestry courses in London, preparing for entrance into the Faculty.

## THE POWER OF PRODUCING WEALTH

The power of producing wealth is therefore infinitely more important than wealth itself; it insures not only the possession and the increase of what has been gained, but also the replacement of what has been lost. This is still more the case with entire nations (who cannot live out of mere rentals) than with private individuals. Germany has been devastated in every century by pestilence, by famine, or by civil or foreign wars; she has, nevertheless, always retained a great portion of her powers of produc-

tion, and has thus quickly re-attained some degree of prosperity.—

(“*Foundations of National Prosperity*”)

Dr. Felix Regnault entertains the view that the decadence of Greece, Rome, Spain and Italy has been due primarily to a failure to practice conservation.

## AIRPLANES FOR B. C.?

The feasibility of the airplane for forest fire patrol work is regarded as plausible by Hon. T. D. Pattullo, provincial minister of lands.

His opinion regarding advantages which should be derived from the inauguration of such service was expressed in conversation and an air service veteran who returned after being wounded six times, furnished him the inspiration. Such returned flying men, thought the minister, would prove invaluable to the governmental forestry branch for patrol work along the British Columbia coast areas. The distance they could cover in a day's run would aggregate more than that of three or four mounted patrolmen on terra firma, while observation from the air over forest areas would have manifold advantages over observations taken from the ground.

## HOW TO PREVENT FOREST FIRES

Never leave camp with your camp-fire burning.

Never drop lighted matches or tobacco in the woods.

Never clear land by fire in very hot weather.

Try taking these precautions this year only.

You'll do the same next year by habit.

# The Management of Woodlots

G. C. PICHE, CHIEF OF FOREST SERVICE, QUEBEC.

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Recognizing the gradual diminution in merchantable timber, and even in certain places, of firewood, it becomes more and more evident that it is necessary to take proper precautions for managing the forest property in a systematic fashion. The Provincial Government, controlling the greater part of our forests, has established very suitable regulations, whose execution is supervised by the members of the Forest Service. However, a certain very important part of our forest domain escapes this control. I speak here of the woodlots or private woodlands which are distributed through all the province, in all the villages, and which constitute an important part of the inheritance of our farmers.

I should say here that many of our woodlots are very well managed, and could not be handled in a better way. Consequently, the remarks which follow do not apply to these good foresters, but to those who have not heretofore considered the woodlots in a serious manner.

The proper management should be carried out so as to remove only the annual crop, that is to say, an amount of wood equal to that produced by the woodlot during the year. If one cuts more than the yearly production, what the foresters call the "increment," there results a gradual reduction of the forest capital. It is necessary to understand that often owners of woodlots are obliged to make heavy cuttings, for instance when one wishes to construct a building or to realize a certain sum of money which he requires; but with proper organization one foresees such a necessity and, instead of removing each year all the crop of wood, a certain portion is left in reserve. Just as is done in properly managed financial institutions, such as banks, the proprietor of a wood lot ought to

establish a reserve fund by economies made each year. A second point to observe is to direct the cutting towards the trees which have practically reached full growth. If we consider the tree as a capital, yielding each year a certain percentage of interest, we should remove the tree when its percentage of interest, that is to say, the annual increase, falls too much below the mean, and replace it by a younger and more vigorous tree. Trees injured by storms or lightning should also be cut out each year so as to obtain all the benefit the wood can give before it deteriorates by rot. Also, those that are attacked by insects or fungi are equally exposed to destruction and ought to be removed without delay; finally, when fire sweeps over a portion of the woodlot it is necessary to hasten the removal of the injured trees.

It is evident that there is really very little extra trouble in managing a wood lot properly so that it can give the proprietor a fair revenue. Naturally, if there are places bare of trees it is of the greatest importance to plant them with suitable species, and for this purpose one can obtain from the nursery at Berthierville, Que., all the plants desired under advantageous conditions, for the Provincial Government takes great interest in the question of reforestation. The Hon. Mr. Allard, Minister of Lands and Forests, will be very pleased to see all the forest owners cover the clearings in their woodlots with judicious plantations, that is to say, with species appropriate to the local conditions. He would be glad to have all those who need advice write to the Chief of the Forest Service, Quebec, explaining to him the conditions obtaining in their woodlots, whose management they wish properly organized; the Government Forest Engineers will then furnish freely the necessary advice on the management

of the plantation so as to improve and perpetuate the property.

The Forest Service can assist the forest owners in the following ways:

1. In preparing a plan of management of the woodlot.

2. In furnishing at the ordinary price the necessary plants for filling the clearings in the property.

3. In indicating the methods of cultivating the most profitable species of trees for the woodlot.

When it becomes necessary to examine the woodlot the conditions will be as follows:

The Forest Service will pay the salary of an expert who is appointed to make the examination; but the forest owner will defray the expenses of board and transportation, the

estimated amount of which should be forwarded in making the application, so as to avoid misunderstandings.

It would be preferable for several neighboring owners to unite so as to reduce the individual expenses; and from the standpoint of the Forest Service this will be very helpful, for we have only a small number of forest engineers at our disposition, and consequently, cannot send them everywhere.

We hope that those interested will study this question seriously, since it is greatly to their advantage, and that they will profit by the assistance so generously offered by the Provincial Government, thereby increasing the interest from their property and, consequently, their income.

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## *Digging Wealth from Buried Trees*

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Forests of New Zealand which flourished and died so many ages ago that the ground they covered is now swamp and plain, are yielding more than a million dollars a year to Maori natives and whites who dig kauri gum, the undecaying resin of the prehistoric trees.

Nearly \$100,000,000 worth has been gathered in the last half century and an equal amount remains to be dug. From two to 12 feet under the surface of the earth the resin lies, in strata which show that three successive forests matured and died in the creation of the deposit which is used by manufacturers of linoleum and varnish in the United States and Great Britain.

The trees of the kauri forests of today furnish the most valuable wood of New Zealand for general building purposes. The tree is a giant of the bush that ranks with the cedars and firs of Northwestern America in girth but not in height. The diameter runs from four to 12 feet, with specimens that have measured 15 and even 20 feet. The height averages 80 to 100 feet, with a maximum of 150 feet.

### *Cover Old Forests*

The great gum deposits are not

found in the forests of the present day but on fern-covered hills, plains and swamps. In some instances the buried forests flourished so many ages ago that no trace of them remains except the hundreds of millions of pounds of resinous exudations.

The gum fields are principally in the provincial district of Auckland in the northern part of the North Island, covering about 1,800,000 acres. At one time kauri gum was so abundant that it was dug out with little trouble near the surface, but half a century's industrious digging has diminished the supply until now it is necessary to go down several feet for it. In some cases the excavations go to a depth of a dozen feet, and recently companies have begun operating with converted gold dredges.

### *Brings \$1500 a Ton*

The gum, as it is found, varies from the diameter of a marble to lumps weighing 100 pounds or more. In color it ranges from pale lemon yellow and reddish brown to almost black. Much of it is transparent or semi-transparent. Its grades for market purposes are as varied as its coloring. The most valuable deposits are found in dry soil and the best grades bring as much as \$1500 a ton,

while specimens varying in color from light amber to brandy, no larger than a teacup, have sold for \$100.

The swamps yield the dark colored resin, which is cheap. The average value of all the gum is about \$300 a ton. In 1913, when 9596 tons were produced and 8780 tons exported, the average value of the exported article was \$315 a ton, a dozen times its worth when its export to the United States began in the early sixties.

Better grades of the gum are used as a substitute for amber in the manufacture of mouth-pieces for cigar holders and pipes. The great bulk of it is used in making oil varnishes and linoleum. The most recent use is believed to have been in the manufacture of explosives by the Germans, who are known to have bought thousands of tons of it in the years preceding the declaration of war in 1914.

#### *Equipment is Simple*

The digger's equipment usually is a light pointed iron rod which is used to test the ground, and a spade. Many diggers, however, notably a large number of Austrians who have gone to New Zealand expressly to gather kauri gum, do not use the spear but turn the soil completely over with a spade. As a rule they work in gangs of 20 to 30, passing the winter on the highland and the summer in the swamps and lowlands. They work long hours in the fields and other hours night and morning scrapping gum in their camps.

The earnings of the gum digger vary greatly. Some earn from \$3 to \$5 a day; others make as much as \$40 or \$50 in a week, but the higher figures are not realized long. In exceptional cases diggers have secured \$250 worth of gum in six weeks or a few Maoris have obtained half a ton in a week from a small patch.

Including Maoris and aliens, principally Austrians, gum digging has employed 10,000 persons at a time, although, as many of these are youthful or aged natives, the labor was equivalent to 7000 able-bodied persons. Many of the Austrians were recalled to their native country prior

to the war. Those who remained petitioned Premier Massey to be sent as soldiers in the Allied cause, but their petitions were refused.

Gum digging is a standing resource for the industrious unemployed in New Zealand and has enabled Auckland to tide over periods of serious commercial depression with comparatively little difficulty. It has also been of vast benefit to hundreds of settlers with small capital.

#### *Kauri Forests*

Valuable kauri forests of the present day have been burned purposely to make way for settlement, against the advice of forestry experts that it would have been better to have kept the area as national or state forests. Kauri timber is nearly vanished from the islands.

It is stated that kauri timber burned in the Puhipuhi forest would have had a value of £3,000,000 had it been worked into lumber. As late as 12 years ago it was reported that there were 160,000 acres of kauri forest standing in its natural state. Most of this has been burned to do away with alleged fire hazard and to clear land, and kauri timber has doubled in price in the last 15 years.

Besides these direct losses, New Zealand is suffering from the squandering of some of its most beautiful scenery because of the destruction of the forests.

#### **RANGERS MUST REGISTER**

Toronto, June 10.—Unless representations that are being made to the authorities at Ottawa, by the Department of Lands, Forests and Mines are successful, vast stretches of Northern Ontario are going to be left unpatrolled by fire rangers for several days, because of national registration on June 22. The regulations declare that each man must personally register at the headquarters of the registrar for the area, which would mean that all the fire rangers would have to leave their posts and journey to the registration point. Some of the men would have to be away several days to make the return journey to the headquarters.

## The Tragedy of Cross Forks

BY SAMUEL T. DANA, U. S. FOREST SERVICE.

The effects of forest devastation on community development are seen most clearly in the smaller towns in the regions primarily adapted to timber production. Here deserted villages are signposts that too often mark the trail of lumbering operations. As in the mining regions of the West, towns spring up almost overnight, flourish for a few years, until the adjacent timber is cut out, and then sink rapidly to inactivity or even complete extinction. Unlike mining towns, however, there is not the same necessity for their disappearance. Timber is a renewable resource, which can be so handled as to insure continuity of cut and therefore of industry.

In the mountain counties of Pennsylvania, particularly in the northern part of the State, one comes upon town after town that has declined with the passing of the forest. Run down and deserted houses still standing give an idea of the towns' former prosperity. Six and eight room frame houses with up to half an acre of land can be bought for from \$200 to \$400.

Most striking of all, perhaps, is the rise and fall of Cross Fork, in the hills of southeastern Potter County. In the fall of 1893, before lumbering operations started, perhaps five or six families were living on the site where two years later stood a busy town. For some 14 years Cross Fork led a feverish existence while the forest wealth was stripped from the surrounding hills. The life of the town was, of course, the big sawmill, which had a daily capacity of 230,000 board feet and was up to date in every respect. In 1897 a stave mill was established also, and various other minor wood-using industries existed at different times. In its prime, Cross Fork had a population of 2,000 or more and was generally known as one of the liveliest, most hustling places in the State. A branch line of the Buffalo and Susquehanna Railroad was built to the town. Stores of all kinds flourished. There were seven hotels, four churches, a Y. M. C. A. with baths and gymnasium, a large, up-to-date high school, two systems of waterworks, and two electric light systems.

But the prosperity of the town was as short-lived as the timber supply. In the spring of 1909 the big sawmill shut down for good. From then on the population dwindled rapidly. Fires became so frequent that the insurance companies canceled their policies. Five-room frame houses with bath were offered for sale for from \$25 to \$35 without finding a buyer. In the winter of 1912-13 the stave mill also ceased operations, and the next fall railroad service, which for sometime had been limited to three trains a week, stopped altogether. To-day the total population consists of but 60 persons. If it had not been for the State, which bought up the cut-over lands and has undertaken in earnest the work of reconstruction, the town would be as desolate as the surrounding hills. As it is, Cross Fork is now a quiet little hamlet, the merest shadow of its former self and without hope for an industrial and useful future until the timber grows again.

The cut-over lands of the Lake States tell the same story of temporary prosperity characterized by the rise and fall of mushroom towns. Immense tracts of little value for anything except timber production have been left dotted with deserted villages as the lumber industry devastated them and swept on. Meredith, for example, was once a prosperous town in the north-eastern corner of Clare County, Mich., for which one looks in vain on any modern map. To-day its hotels are in ruins, the town hall has been moved elsewhere, the railroad which connected it with the outside world has been torn up, and its population has dwindled from 500 to 3.

## War and The Birds

By N. TOURNEUR, THUNDERSLEY, ENGLAND.

Certain wild things, as a rule, seem unfrightened and wholly undisturbed by the long spells of the tremendously heavy gun-fire on the Western Front. It is singular to note that, though the birds there may be silenced by a thunder-storm they sing continuously through the deafening roar of a heavy bombardment of the trenches. The lark rises singing between the lines, and the wren plays among the brambles, despite the thundering of the guns.

When, as in the Forest of Argonne, one leaves the more leafy soil of the surface path for the mud of a communication trench,—and surroundings where trees and undergrowth have suffered more severely, and where one can only set his foot at the risk of his life,—plant, insect, and bird life again go on undisturbed. It is, as it were, as if war with all its appalling turmoil had now become so familiar to the kingdom of birds and wild animals that it had lost its power to frighten.

During the winter and spring of 1914 and 1915, however, wild animals of all kinds, scared by the heavy cannon and rifle firing, fled from Germany and parts of Austria, and entered the Swiss forests and the Alps. They included wild boars, deer of several kinds, goats, etc., as well as innumerable wild fowl; and, in the Lower Engadine, even bears entered the Swiss Yellowstone Park, as it is termed. The lakes and rivers of Switzerland were crowded by the denizens of the air and the marshes, and fowlers were busy, till shooting was prohibited by the Swiss authorities, and sharp imprisonment instead of fines dealt out to offenders against the law. The strangers were then allowed to have a rest in peace and comfort before continuing their journey southward to warmer climes.

There is no doubt whatever it was the war that frightened the animals

and birds from their accustomed haunts, and crowded the Swiss lakes and forests. A large number of wild bears from the Black Forest entered the Jura Alps, across Alsace and Lorraine, and in passing through the fighting armies were noticed by many of the scouts and other soldiers.

Use and wont, however, prevail in wild life, even as they do in human Deer again feed in the glades of the Forest of Argonne, despite the hurricane of shells that may fall but a few miles away, till everything green disappears, shredded and pulverized, into the torn earth, and only stumps of trees are left protesting mutely against the folly of man. And, here, too, in the Forest of Argonne, an officer taking his morning ride may come upon the magnificent wild boars still frequenting the lonely thickets.

It may be probable, though, that this long period of great hostilities is influencing bird life in another and more remarkable way. The roar of the heavy artillery may possibly have diverted or retarded the movements of birds on their migratory course. And a curious effect has been noticed in the Midlands of England, and elsewhere: every year since the war began, the swallows and martins and other migrants are loath, very loath, to leave.

*The Forestry Journal will be sent to any address in Canada for One Dollar a Year. . . .*

# The Fight to Save Our White Pine

BY PROF. J. H. FAULI, PH.D., UNIVERSITY OF TORONTO.

## Northern Ontario and Western Canada Must be Guarded Against Deadly Menace of Blister Rust.

The terrific destruction wrought by introduced fungi and insects has been demonstrated too often to allow us to supinely take a chance with White Pine Blister Rust. It has been recently estimated that the United States alone suffers losses of at least \$500,000,000 annually from imported pests. Two or three examples will suffice. The potato blight was brought into Ireland in the middle forties; two years of its ravages served to cut the population of Ireland into two by deaths from famine and by emigration; its effects even reached America, and the Irish political domination in New York and other places along the Atlantic seaboard today is to be traced back to the immigrations of that period. The American grape mildew gained a foothold in France about 1850. The result was disastrous, the yield being reduced to one-tenth or one-twentieth of the normal, ruining growers, causing migration, and necessitating a radical change in cultural methods. The latest instance is that of the chestnut blight, a disease introduced from central China on stock of the Chinese chestnut; starting from New York city in 1904, it has swept relentlessly to the northern limits of the chestnut forests, to the west as far as western Pennsylvania, and south into the Virginias and Tennessee, over wide stretches destroying 100 per cent. of the chestnut of all ages, resulting in a loss that two or three years ago was variously estimated up to \$100,000,000; the calculations of foresters for reforestation throughout the chestnut zone have been completely upset; the value of the chestnut as a basic forest tree has vanished. The fungus that causes the blight we now know occurred only in China on Chinese

chestnut, which is so resistant that comparatively little damage results. Up to 1904 the fungus was not known to science and was apparently restricted in its distribution to China. It is a striking example of the increased virulence exhibited by many parasites when transferred to a new species or variety of host.

### *Blocking New Diseases*

Passing around the circle we find our optimists linked with the equally dangerous fatalistic pessimists, who, too, would pursue a *laissez faire* policy. They argue that wherever there is commercial intercourse the maladies will follow the traders' flag, and that in spite of our best efforts, in time plant pests of every kind will spread to all parts of the civilized world, limited only by the existence of unfavorable natural conditions. They are wrong, for, just as many diseases of man have been prevented from gaining a foothold in Canada and the United States, such as bubonic plague and leprosy, so too, there are hundreds of plant diseases, like European potato canker and the root knot of alfalfa that have not been allowed to establish themselves on the American mainland. Speaking for the Department of Agriculture of the United States, one of their leading plant pathologists remarks: "The securing of these diverse species and varieties of plants from all quarters of the world, however, is always accompanied by the danger of introducing foreign diseases of these plants along with the plants themselves. A special inspection is maintained for the purpose of preventing the introduction of such diseases, and it is not overstating the truth to say that dozens of dangerous new diseases are intercepted every year."

These pessimists are likewise wrong when they advocate that a disease may just as well be allowed to run its course once it has gained entrance, that to make expenditures on control or eradication measures is throwing good money after bad. That doctrine is vicious. There are many, many cases in which effective economic control and preventive measures have been devised, which, when applied, reduce staggering losses almost to the vanishing point, as with yellow fever in man, and with various smuts, mildews and rusts among plants. It is true that the chestnut blight appears to have passed beyond control but it came like a bolt from a clear sky; it was here and probably already beyond control before we even knew of the existence of the fungus that causes it; certain it is that during the two years spent in becoming acquainted with its mode of reproduction, of dissemination and attack the case had become hopeless. In its newness to botanists, in its lightning spread, and its quickness and completeness of destruction, the chestnut blight organism stands unique certainly among tree-destroying fungi. But the case of the blister rust of the pine is different. We have long known this pine rust and the vital features of its life history, so that it is not necessary to defer action pending the discovery of further scientific data.

#### *Control and Prevention*

I have pointed out that we have the blister rust of the pine with us—it is spread practically throughout all the well settled part of Southern Ontario and probably Quebec. I have produced evidence to show that it is a dangerous menace, and I have taken the ground that an active campaign should be waged against it. But what action?

1. The prime necessity in the blister rust situation is **action**, and our best energies should be directed towards **eradication** and **control**, we possess the knowledge essential to those ends. Further research will add new data of value, and so must be provided for, but the foundation principles governing the course of

action to be pursued are in hand.

2. A study of the history of this disease in America attaches the full blame for its introduction to the imported white pine stock, and it likewise reveals the fact that the disease occurs in the nurseries or forests of Russia, Germany, Austria, Denmark, Holland, Belgium, France, England, and now the United States, Ontario and Quebec. Therefore, an absolute embargo must be maintained against importations of white pine nursery stock from Europe and the United States, and provision should be made to enable Ontario and Quebec to maintain a complete quarantine against such provinces as may be deemed necessary, and to regulate the movement of nursery stock within their own limits. As other 5-needled pines are likewise susceptible to blister rust (the mountain pine of the West, *Pinus monticola* for example, being even more so than *P. strobus*), the embargo must embrace all 5-needled pines.

#### *Fumigation Useless*

It may be pointed out here that fumigation of stocks affected with blister rust is perfectly useless, and inspection at the dock is valueless. This is an example of a disease that can be passed on only by an expert. Looking back over the past, it cannot but be regretted that the services of expert plant pathologists have not been sooner requisitioned. The Dominion government, for instance, took no steps in this direction prior to 1909, and even yet the service is undeveloped and handicapped.

3. Blister rust has not yet been found in the forests of British Columbia, and Alberta. Therefore, a quarantine against the entrance of nursery stock of 5-needled pines should be thrown around those provinces. It would seem desirable, too, that some scouting should be done in them, especially along the transcontinental highways and in the fruit-growing districts.

#### *To Plant White Pine?*

4. It is very questionable if the planting of white pine should be con-

tinued in Eastern Canada. This is a serious blow at what has been a prime and perfectly sound principle in the practice and plans of forestry in America. The first and most valuable choice of trees for reforestation purposes is removed from the list. At all events, to plant white pine in Eastern Canada is almost certain to bring loss and disappointment and with that a lowering of the planting enthusiasm.

If we can keep the disease out of northern Ontario and Quebec, white pine could be safely planted there only if it were obtained from stock grown in the North or West.

5. Whether or not white pine plantations, of which there are several in Canada, should be annually inspected or eradicated, should be determined entirely by the circumstances of the case. Where eradications are effected it would seem desirable that the government should replant with other species of trees.

6. There is no evidence yet, so far as I know, that the blister rust has been carried to America in European

currant or gooseberry stocks. Yet there is a possibility that it could be, and as long as that uncertainty prevails, these stocks should be placed under the same embargo conditions as the pine.

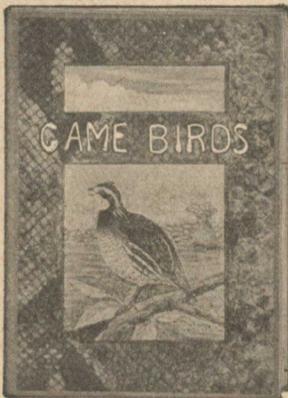
#### *Guarding the West*

7. There is absolutely no question in my mind but that the various cultivated varieties of *Ribes*, and especially black and red currants, are the most potent agencies in the spread of the blister rust. There is a free and extensive movement of these commodities throughout Ontario and the other eastern provinces, and the disease is very readily spread from these plants to others of their own kind as well as to the pine. It is equally certain that the disease can be spread to the West in the same way. This opens up one of the difficult features in the situation, the only solution of which lies in an embargo for the present on the shipment of currants and gooseberries into Northern Ontario and into Western Canada except through the Minister of Lands,

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Forests and Mines. Similar action should be taken in Quebec, with the River St. Lawrence as the base line.

It will be of interest here to note some of the quarantines now in force against the white pine blister rust.

specimens similar to the cut. So widely spread is the disease in Southern Ontario that immediate eradication is out of the question. Indeed, we may as well accustom ourselves to the thought that the rust is pro-

Area	White Pines	Ribes	Quarantined Area
Canada .....	All	None	All foreign countries: Europe and Asia, New England and New York are quarantined as regards black currant.
United States..	"	All	East of Mississippi River.
California	"	"	All points outside State.
Delaware	"	"	All points outside State.
Indiana	"	"	All points outside State.
Kansas	"	"	All points outside State.
Michigan	"	"	Europe.
Massachusetts	"	None	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Wisconsin.
Minnesota	"	"	

And similar action has been taken by almost a dozen other states, and as in nearly all cases cited, since the beginning of 1917.

#### Success of Quarantine

It is likewise significant to emphasize the fact that local communities have in more than one case maintained successful quarantines; thus the orchardists of Rogue River Valley, Oregon, combined in 1910, put into effect a quarantine against orchard diseases, and hired an expert plant pathologist as an adviser. Similarly, the melon growers of Rockford, Colorado, have employed such action with success.

8. Scouting carried on during the last two years by the Ontario and federal governments has shown that blister rust is spread throughout practically all of southern Ontario with a spot infection at Petawawa, and others in Haliburton, Victoria, Peterborough and Simcoe counties. Much valuable information in this work has been gained through the schools in response to a circular with colored reproduction of a diseased currant leaf sent out by the Ontario Forest Service, at the suggestion of Mr. W. A. McCubbin, calling for

probably a permanent factor with us in Canada and will have to be considered in future forestry propositions and be combated as in the case of cereal smuts, potato mildew and other blights. Our commercial pine forests lie mostly north of the old Canada Atlantic Railway, which runs from Parry Sound to Pembroke and Ottawa, and the infection has not yet crossed that line except at Petawawa. It would seem most hopeful then to isolate Northern Ontario, with the Canada Atlantic as the southern boundary, and that using this as a base, operations be directed towards the south. These operations would consist of scouting, of eradicating spot infections, and of experimenting with safety belts. In regard to the last operation, there is good reason to believe that the fungus will not spread beyond a belt a third of a mile wide if that be kept free from the alternate host. Michigan touches Northern Ontario along the St. Mary's River, and Michigan is said to be free from the disease and is guarding against it. There is some infection in Southern Minnesota, but the State authorities are actively engaged in routing it out. In Quebec, the St. Lawrence forms a natural bar, and suitable action could

prevent spread of the rust northwards.

The quarantine maintained by Northern Ontario should involve pine and Ribes (gooseberry and currant) stocks and possible Ribes fruits.

#### *Southern Ontario*

The problem of Southern Ontario remains and is a very perplexing one. One thing is certain, that as long as we make a fight to keep blister rust out of Northern Ontario it will be necessary to keep in touch with the situation in the southern part of the Province, by means of scouts, schools, or other agencies. It might prove feasible, too, to conduct or to encourage local campaigns in the various affected counties, making use of existing organizations in this work. Such campaigns would have as their object eradication or control. In some districts the value of the currant industry is insignificant, and if such areas could be kept free from the currant, white pine could be planted with safety. Local conditions would determine the action to be taken in every case.

9. The situation in Quebec is not so certain, and this is unfortunate, for if the disease has a foothold north of the St. Lawrence River, not only are the richest of the Quebec forests menaced, but also the task of keeping it out of Northern Ontario is rendered doubly difficult and costly. There should be no delay in carrying out an intensive scouting campaign in Quebec north of the St. Lawrence, and in eradicating or controlling such infections as may happen to occur. The movement of Ribes stocks and possibly fruits should likewise be regulated.

10. The outlook is serious, and the proposition of protecting our pine forests a big one; it is a proposition for the forester and the pathologist, the lumbermen, the nurserymen and local agencies; our efforts may be like an attempt to sweep back the tide, but on the other hand, they may be partially or completely successful. It is, of course, conceivable that our fears are overwrought, but experience does not encourage that hope. The

stakes are large and warrant our best-conceived and prompt effort. Encouragement is to be gained from the fact that the disease has been eradicated from the small areas in Michigan, Indiana, Ohio, and Pennsylvania in which it had broken out, and from one infected spot in New York State, and one in Wisconsin—though only after prompt and drastic action. Southern Ontario and Southern Quebec are infected badly, but our north country is free. Now whether or not our great pine forests of the North will fall a prey to this destructive disease depends on the promptness and efficiency of the action taken. Every stroke will tell if rightly landed, but there must be a good many of them, and today not tomorrow. The problem is a big one and no longer confined to a single interest. It involves federal and provincial governments, lumbermen, and nurserymen—with a relationship, too, to the bordering United States—therefore, it is to be strongly urged that a Commission representing all these interests be appointed to have full control of the entire blister rust situation. On the outcome will depend the reforestation policy of Canada (and to some extent of our neighbors across the line), and the health, productivity, and perhaps existence of our valuable commercial white pine forests.

#### RESOURCES AND POPULATION

As time goes on, there takes place a gradually reversing proportion of population and natural resources until the multiplication of settlements and growth of cities render the intensive industrial processes of manufacturing and commerce and a more prudent use of natural resources matters of sheer necessity. This very logical readjustment in passing from the simple economic activities of a primitive existence to the complex organization of modern industry, as population increases, is frequently said to exemplify man's most progressive trait—adaptability to environment.—(*"Foundations of National Prosperity"*)

## War Needs Collide with French Traditions

Lieut. R. G. Lewis, who is with the Forestry Corps in France, and who in civil life has charge of the forest statistics work for the Forestry Branch, Department of the Interior, Ottawa, writes as follows:—

"We have a French forester attached to us in the capacity of inspector, chiefly I believe to see that we don't do too much damage to the French forests in removing what the British army has bought from the French Government. He speaks no English and his complaints received scant attention at first as the damage was usually done (and often concealed before he could make his complaint through an interpreter. I have been inspecting with him for the last few weeks and whenever his complaints were not unreasonable I have tried to adjust matters. Of course it is absurd to suppose that in war time when there is an urgent demand for lumber of all descriptions, we should take as much time to exploit a coupe as the French bucherons do in peace time. We can, however, avoid unnecessary damage and still keep up production and that is what I am trying to accomplish. I also keep track of the progress of the exploitation of each coupe and compare our final figures with the French service's estimates which are wonderfully accurate. I manage to pick up considerable valuable information along forestry lines from the commandant and from French literature he has recommended and which I am translating. Taking it all into consideration I believe I may derive some benefit from my transfer to the so-called Forestry Corps after all. I have certainly been convinced since I came to France that we weren't taught enough about French forestry methods at the Faculty of Forestry. And I am also convinced that some modification of the French "selection" system is more applicable to Canadian

conditions than the more artificial German methods."

In a later letter Mr. Lewis says:

"I am still trying to keep the peace between the demand for lumber and the threatened destruction of forest and have come to the conclusion that the man between the devil and the deep sea had more or less of a sinecure. But so far no actual blows have been struck and I have hopes that the war will end before the opposing factors come to actual violence. We keep our stumps low, down to eight or ten inches above ground, we pile our brush as we go. We avoid logging with a donkey and cable and I am sure the loggers have learned to show the volunteer growth more respect than it ever received before at the hands of a Canadian lumberjack. But of course from a forestry standpoint without regard to the war and its necessities, we do a great deal of damage that could be avoided. However, taking everything into consideration, I do not think we do any more damage than is necessary considering the quantity of timber we produce and the speed with which it is produced. And the constant cry is "More production."

**"Do not leave a fire until it is out.** After the fire is surrounded by a fire trail, and back-firing has been done, the crew should be put at work covering all burning logs and stumps with earth. If available, water should be used to extinguish all smoldering places along the fire-trail. The crew should not be reduced too rapidly, since a high wind may fan the smoldering fires into flame which will spread across the fire-trail and all the work of days will be undone. Keep one man on the burned area at least three days after the balance of the crew is disbanded. This is the most important rule of all."—*From instructions to fire rangers of California State Forester.*

## Good Results in Prairie Planting

BY ALEX. HARDING, LOUGHEED, ALBERTA.

When I began the work of raising conifers here twelve years ago the work met with the greatest scorn and ridicule from the public. People hoped that the experiment would be a disappointing failure. I was young then and the district had just been opened but today most people consider that it has been a fine work. Most of the spruce are now eleven years from seed and many of them are from 7 feet to 9 feet 5 inches in height. Pines are nine years and range up to 12 feet high.

I have saved seed at times since and have a small stock coming on. I also set in parcels of young trees from the woods. I have planted a good sized patch both in the natural woods and in the open, but at present my intention is to carry out a thorough experiment covering all features of the work so that in time I can plant

a fairly large area with the greatest economy.

Protection against the various enemies of trees is the thing which offers the greatest difficulty, but I think that ways have been arrived at to meet them.

It is my desire to carry out an experiment with Engelmann spruce but so far have been unable to obtain either seed or little trees from our own Rockies. It is not that I expect this species to excel the white spruce, but I consider it best to make use of several of the best species of timber trees when developing a farm woodlot. The white spruce is very free from injuries and defects but no one can tell what is ahead and by referring to European texts it becomes quite plain that trusting mainly to species is not the best forestry method.

### What is the Purpose of Conservation ?

The purpose of conservation, in practice and as a public policy, is to increase the productive power of natural resources and to heighten social values. As we insist, it deals not with natural resources alone, but with the coordinated functioning of natural resources, labor, and capital; and it is particularly concerned with their productive possibilities in the future as compared with their actual utilization in the past and the present.—“*Foundations of National Prosperity.*”

### Private Rights and Social Welfare

“The final arbiter between private rights and social welfare is official authority asserted in behalf of the sovereignty of the State and perpetuity of society and made effective through the arm of the police power in supervising and, possibly, restraining the arbitrary exercise of individual freedom and in restricting the unsocial use of property.”—“*Foundations of National Prosperity.*”

“Natural resources are but one of three essential economic supports of industrial society. Excepting extreme conditions of extensive or intensive industrial organization, land, labor, and capital are mutually interchangeable and compensatory in productive processes. The economic importance, or value, of a unit of either in terms of another is, at any time, inversely proportional to the relative supplies of the two.”

Conservation has been characterized as a managerial policy designed to promote industrial capacity.

# Genealogy of Forest Products

By G. C. PICHE.

- A—Raw materials obtained from the forest without manufacturing.**  
 Firewood, mine props, fence posts, hop poles, railway ties,  
 masts, marine timber, booms, poles.  
 Sawlogs, square timber, flat timber.  
 Hemlock bark, birch bark.  
 Foliage for decoration purposes, fruits, nuts, flowers.  
 Spruce gum, pine gum, tamarac gum, Canada balsam.
- B—Uses of forest products in the industry.**  
**I—The timber is not affected in its physical appearance.**  
**a—The industrial preparation is brief.**  
 Sawn lumber, deals, boards, etc.  
 Building timber, beams, joists, rafters, etc.  
 Shingles, laths, mouldings, flooring, etc.  
**b—Manufactured goods.**  
 Packing cases, boxes, cooperage goods, veneer furniture,  
 carriages, farm wagons, railroad cars.  
 Musical instruments, caskets and coffins, trunks, valises.  
 Excelsior, shuttles, spools, bobbins.  
 Agricultural implements, machine construction, handles,  
 pulleys, boot and shoe findings.  
 Matches and toothpicks, brushes, novelties, woodenware.  
 Ship and boat building, sporting goods, etc., etc.
- II—The wood is transformed into pulp and paper.**  
 Mechanical pulp, chemical pulp or cellulose.  
 Newspaper, writing paper, wrapping paper, toilet paper.  
 Fibreware (buckets, pails, tubs) undergrounds, conduits,  
 viscose, twine, cloth, carpet, artificial leather, all manu-  
 factured from pulp.  
 Mordants, alcohols, turpentine, acetone, Oxalic acid, etc.,  
 extracted from residual liquors of this fabrication.
- III—Maceration or distillation of wood, leaves, etc.**  
 Potash, obtained by washing ashes.  
 Tanin, drawn from the barks of oak, hemlock, etc.  
 Charcoal, residuous of the distillation of wood.  
 Wood alcohol, turpentine, Acetate of lime, gas, tar, creosote,  
 obtained by distillation of wood.  
 Cedar oil, spruce oil, etc., by distillation of needles.  
 Maple syrup, maple sugar, birch syrup, by evaporation of sap  
 of maple, or birch.

## *Fickle Policies and Timber Rotation*

BY SIR RONALD MUNRO-FERGUSON.

"A crop of timber is not like a crop of corn. It needs a rotation on the average in Australia of, I suppose, from 60 to 70 years; sometimes more or less. But if you take an average of 60 to 70 years, it means that you have to look forward to that time, and the man who plants to-day will be judged 70 years hence by the results of his handiwork, and he will be regarded either as a benefactor of his country or a parasite upon it, according to the result of the cutting.

To secure that continuous good management over so long a period is, therefore, essential. There must be no break, no change of policy. Ministers, governments, majorities as I know very well from my experience, are creatures of the day—here to-day and gone to-morrow—but forests go on for ever, and, therefore, either by commissions or otherwise, provision is necessary to secure a permanent policy without change, but always making improvements."

## *The National Purse and the Paper Mill*

In 1912 the total value of pulp and paper products, exported from Canada amounted to but \$14,659,325. In the ensuing six years this amount had increased to \$52,924,888. For the current fiscal year the total exports promise to exceed \$60,000,000,—the ten months ending in January, 1918, showing a total of \$51,817,707. More than one-half of this amount applies solely to newsprint paper, of which our exports last year exceeded \$26,000,000. The figures also include chemical pulp to a considerable amount and mechanical and pulp wood and other minor products. Most of these exports were sent to the United States. The annual domestic consumption of paper produced in Canada exceeds in value \$20,000,000,—making a total annual production of pulp and paper for foreign and domestic use of approximately \$80,000,000.

In 1890 there were 58 pulp and paper mills in Canada, capitalized at \$7,574,118, and giving work to 2,817 employees. In 1915, the number of mills had increased to 80, the amount of invested capital to \$133,-

736,602, and the number of employees to 15,686.

The amount of capital at present invested in the pulp and paper industry in Canada is more than \$145,800,000. Together with transportation and electric light and power development, the pulp and paper industry ranks as one of Canada's three greatest industries.

The phenomenal growth of the Canadian pulp and paper industry is traceable, primarily, to government restrictions placed upon the export of pulp wood from Canada and the removal of the import duty on newsprint paper and pulp by the United States Government. To these may be added the influx of a large amount of new capital, the enterprise of the manufacturers and a greatly stimulated demand for the finished product during recent years.

The value and importance of such an industry to the Dominion of Canada at the present time—in view of the fact that our unfavorable trade balance with the United States, our chiefest buyer of pulp and paper products, now exceeds \$400,000,000 annually—is almost beyond computation.

# New Brunswick on the Right Track

(From the report of Hon. E. A. Smith.)

My predecessor in office is entitled to the thanks of the people of this Province when he organized the Forest Survey, and I am glad here to place the credit where it belongs. Here we have a staff of professional men, non-partisan, with one great object in view, the preservation and care of the forests. The Department of Forestry was carefully planned with a competent staff and an up to date equipment. My proposal for this new Crown Land policy is to remove the administration of the forests to a very large extent, if not altogether, from the sphere of politics. This does not mean that we are going to eliminate the present service altogether, but on the contrary we propose to retain many competent men now in the employ of the Department. It is proposed to combine the following services, viz.:

- Protection of forests from fires .
  - Scaling of lumber cut on Crown Lands.
  - Protection of game
- With one efficient staff the Chief Officer of which will be The Director of Forest Surveys under a Board consisting of:
- The Minister,
  - The Deputy Minister.
  - The Director of the Forest Branch and two others, one representing the leaseholders and one representing the owners of Crown Granted Timber Lands.

The Board will have authority to appoint the necessary staff to carry out these duties and the men employed to possess the necessary qualification after examination. It is estimated that a fund of one hundred thousand dollars will be required annually to carry on this service and it is proposed this fund will be raised as follows:

From taxes received from wild lands.....	\$ 30,000
From Licensees Crown Lands	

one half cent per acre about.....	30,000
From Provincial Government.....	40,000
	\$100,000

A new up to date fire service to be inaugurated to include the organization of sufficient competent men to cope with forest fires in all parts of the Province, whether on Crown or granted lands; building telephone lines in the forest; erection of look out stations; cutting fire trails; necessary tools for fighting fires; gasoline engines for railway work, in short everything that experience has taught is necessary in the prevention of the great fire evil. Already we have the co-operation of the Railway Commission in extinguishing fires along railway lines, together with their valuable support and advice in the past in all matters of a fire nature. It is my hope in the very near future, the Canadian Government Railway System will become subject to the Railway Commission in all matters regarding forest fires.

At present the fire service is more a name than a reality. It is true the game wardens by their commissions are appointed fire wardens as well, but it is found when a fire breaks out these men are left pretty well on their own resources and are without the necessary equipment and organization to cope with the fire evil.

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## Great Fire Hazard in N. W. Ontario

Representatives of railways, lumber and pulp and paper interests, the Ontario Government and fire rangers of Ontario recently held an important meeting at Port Arthur, in an endeavor to secure closer co-operation of all interests in the prevention and fighting of forest fires.

It was shown that the protection of the existing pulp and timber limits was absolutely essential to the future of the lumbering and pulp and paper industries. It was no less important to the agricultural future, since lands that had been badly burned over were rendered practically useless by the destruction of the soil. The district covered by the meeting boasts of its potential water powers, yet if the forest areas were destroyed, the value of these resources for water power purposes would be cut in two for all time and the rivers made subject to excessive floods and droughts with resultant damage to all dependent interests.

### Reasons For High Hazard

The hazard in the district was rendered much greater:

1. Because of the abnormally dry spring weather and almost entire absence of rains, and location in proximity to Lake Superior, which retards the early spring growth.
2. High prevailing winds during the dry period of April, May and June.
3. Increased danger from settlers' fires, due to opening up and clearing of lands.
4. From Loon Lake on the east to the height of land at Raith, on the C. P. R. and C. G. R., and Kasha-bowie on the C. N. R. there are the heaviest railroad grades between the Atlantic seaboard and the Rocky Mountains. The consequent danger from locomotive fires in this area are greatly increased.

### Publicity and Vigilance

It was recognized that in addition to all other precautions, that publicity co-operation, and eternal vigilance

on the part of all concerned, must be secured.

On behalf of the Department of Lands, Forests and Mines, L. E. Bliss, Superintendent of Fire Rangers said that he fully recognized the seriousness of the situation, and stated that his department which had recently been reorganized, had arranged for increased protection. In a short time he hoped to have such measures and protection in force as would be second to none in either Canada or the United States.

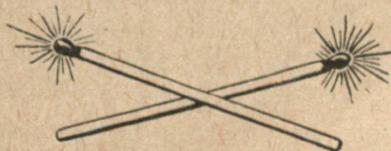
The department was providing for additional equipment such as truck, car, rangers, and lookouts, etc., and that the fire laws would be strictly enforced, that a special endeavor would be made to locate the cause of all fires, and to hold all careless parties legally liable for infraction and disregard of the fire laws, for which heavy penalties are provided, that during the extreme dry season all setting out of fires would be prohibited if found advisable. It was in the interests of all, therefore, that no fires should be allowed to get beyond control, that would endanger the property of others, otherwise drastic measures would have to be adopted.

*The Forestry Journal will be sent to any address in Canada for One Dollar a Year.*

ASK



FOR



## Research Council and Reforestation

Sir George Foster, on May 17th, tabled in the House of Commons a report by Prof. Macallum, administrative chairman of the advisory committee on scientific and industrial research. The report, which is a voluminous affair, covers the various branches of enquiry instituted and carried on by the advisory council since its appointment.

There are some interesting references to the work done by the committee which enquired into the question of the growth and reproduction of the forests of Canada, more particularly those of the eastern provinces. In regard to this matter, the report says:

"The research council is of opinion that this investigation of the growth and reproduction of our forest trees, thus inaugurated and continued, will, in a few years, enable the forestry departments of Dominion and provincial Governments to inaugurate, on a scientific and practical basis, a scheme of reforestation, which will parallel the best results obtained in the past in Europe, and, in consequence, preserve for Canada, one of her greatest and enviable resources, now in danger of extinction, because of reckless waste, and of the almost entire disregard of any system required for its prevention."

Harrisburg, Pa.

### DANGER TO WHITE PINE

Editor, Canadian Forestry Journal.

I beg the privilege of calling your attention to a short article on page 1453, December Number, with the heading "White Pine Immune In N. B.," since the headlines unfortunately carry an erroneous impression.

Probably this has been called to your attention by some of your own plant pathologists, and it may be well and desirable to correct in another issue the impression which might have been gained in the minds of your readers, that New Brunswick

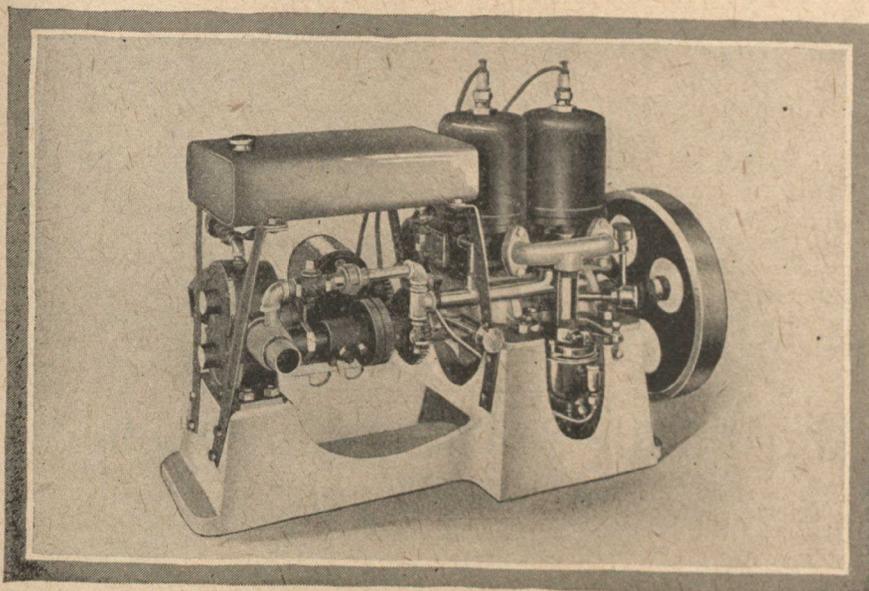
white pine is immune from this extremely dangerous disease. Apparently you desired to convey the idea that the disease had not yet been discovered in this province, but most assuredly the white pine species, wherever it grows, is not immune from the disease. We have the problem with us in Pennsylvania, and I am exerting my utmost effort to hold it in check, and, fortunately, last year by very early and thorough eradication of infected pines, we prevented as far as we could determine by inspection in over half of the counties of the state, including over two and a fourth millions white pines, and over one hundred thousand separate currant plants, the spread of the disease from the pines to the currants. This fortunate situation, I fear, can not last long, even with the most careful inspection.

J. G. SANDERS.

Economic Zoologist.

### LONGEVITY OF TREES

Regarding the longevity of European trees recent information gathered by the German Forestry Commission assigns to the pine five hundred and seven hundred years as a maximum, four hundred and twenty-five years to the silver fir, two hundred and seventy-five years to the larch, two hundred and forty-five years to the red beech, two hundred years to the birch, one hundred and seventy years to the ash, and one hundred and thirty years to the elm. The heart of the oak begins to rot at the age of three hundred years. A *sequoia gigantea*, felled in Calaveras county, California, had attained the age of three thousand years. It was three hundred and eighty-seven feet in height, and measured fifteen feet in diameter, one hundred and twenty-five feet above the earth. The Bradburn yew, in Kent county, England, had attained the same great age.



Fairbanks-Morse Forest Fire Pump showing carburetor side of engine and discharge side of pump.

## AN OPEN LETTER:--

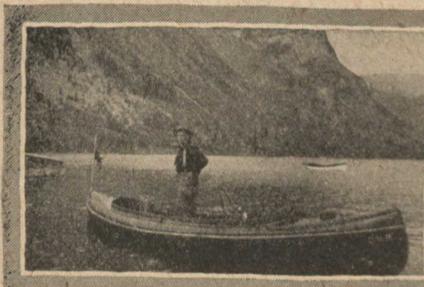
"We extinguished two forest fires on two different occasions with the aid of this pump, using it for three days, each time from 3 a.m. to 11 p.m., only stopping when changing it from place to place.

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## *Paying the Fire Fiend His Price*

*(Excerpt from New Brunswick Forest Service report.)*

The loss due to the destruction of timber alone, to say nothing of the rendering of the soil unfit for good natural reproduction, is so enormous that it surpasses the ordinary imagination. It is the common belief among the people, and is probably true, that had not Cains River been so severely burned, that the vast pine and spruce forests would have been

almost inexhaustible, and that this area would still hold the important place in the forest industry of the Province that it held in the early days of exploitation of the timber lands of New Brunswick. The need of proper fire protection and of scientific management of our existing Crown Land forests can not be too strongly urged at the present time.

## 60 Public Meetings in Quebec in Six Weeks

Some first-class propagandist work has been carried out this month in Quebec Province by Messrs. Victor Baillarge and Gustave Tessier of the Department of Lands and Forests. The Canadian Forestry Association was privileged to co-operate with the Department in the arranging of a series of public meetings in the territory of the Laurentian Forest Protective Association and the St. Maurice Forest Protective Association, covering Central Quebec on the north side of the St. Lawrence. The managers of these associations gave thorough and valuable co-operation in the scheme and went to much trouble in making local arrangements through members of their staffs.

The preparations, however, bore

abundant fruit. Although the idea of public forest protection meetings is something of a novelty in parts of Quebec, Messrs. Tessier and Baillarge met with a goodly reception and were able to deliver illustrated addresses to audiences seldom running below 150 persons and reaching 400 and 450. The assistance of the parish priests was admirable and other leading citizens were glad to give the meetings any help they could.

The consequences of these public lectures, (about 60 since the third week of May) can hardly be measured in mathematical equivalents. It is well-known that ignorance, prejudice, indifference are the great trio of forest destroyers in all parts of Canada, and there is no way of combatting them except by the educational method.

### GOATS FOR BRUSH CLEARING

The use of domestic stock to keep down brush along fire guards and railroad rights-of-way may be a rather novel idea to the forest ranger, but I will back twenty goats to do more work and do it better in brush destruction than one man. When once the large timber and all over eight feet high is down, then leave it to the goats to do the rest. They will surely keep down brush sprouts and

young timber. Herds of angora, numbering five hundred or so, herded slowly along the old tote roads will keep them from ever growing back into brush. One will be surprised at the way a few goats will travel along a road nipping twigs and leaves. They are almost continuous in their work, travel and eat all day and at night they are easily corralled.

When fires would come to those pastured roads there would be small

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chance of crossing and fire fighters would have ten times better chance than if they had everywhere to contend with brush.

I would suggest that those roads be cut to at least forty feet wide and wherever a river and a railroad run parallel, even if fifty miles apart, I would run one of those fire guards from one to the other at reasonable distances apart—say in ten or twenty miles. This would make blocks of country offering reasonable insurance against fire spreading.

If the provincial government ever tries five hundred goats on this work under a good careful flock master, they will never be without them.

H. H. CLEUGH

Vancouver, B. C.

## Large Public Meetings on Forest Protection

Mr. Robson Black, Secretary of the Canadian Forestry Association, held six public meetings in the Ontario Claybelt district on forest protection subjects during the week of June 10th. Addresses were illustrated by motion pictures and "dissolving views" in natural colors. At Cochrane and Iroquois Falls, four meetings were held on Monday and Tuesday to accommodate the children from the schools as well as the adults. The evening meetings were therefore at-

tended almost entirely by adult residents, the capacity of the halls being taxed in all instances.

The relation of the forests to the people of Northern Ontario's tree-covered agricultural soils is by no means identical with forestry interests in other parts of the Dominion, but is none the less emphatically real. It is hoped that further meetings will be held at Timmins and other points during the summer. Members of the Ontario Forest Service gave splendid co-operation.

### A MEMBER'S LETTER

Silver Mountain, Ont.  
June 12th, 1918.

Secretary,  
Canadian Forestry Assoc.,  
Ottawa, Ont.

Dear Sir:—

I am enclosing herewith the Annual Membership fee, and I would like to say that it gives me great pleasure to belong to such an Association. The Canadian Forestry Journal is very interesting and instructive and becomes a great help when speaking to others in my district.

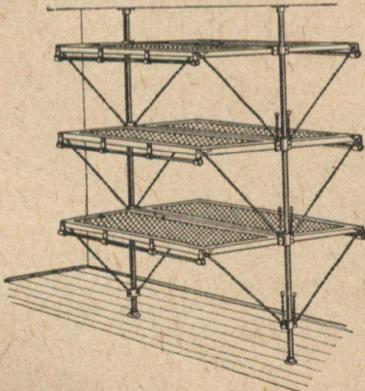
Wishing the Association every success,

Yours truly,  
(Sgd.,) George Walker.

### TO CANADA FOR TIMBER

A report received at Ottawa from J. E. Ray, Canadian trade commissioner, Manchester, England, indicates that the British government is propounding a scheme to erect at least 300,000 houses under state and municipal rate aid as soon as conditions are favourable. "This prospective demand for building timber, doors, window sashes, etc.," says Mr. Ray, "should be closely followed by Canadian manufacturers."

"There are unmistakable signs that after the war, timber merchants and builders will turn to Canada for larger supplies of these structural woods than they imported four or five years ago."



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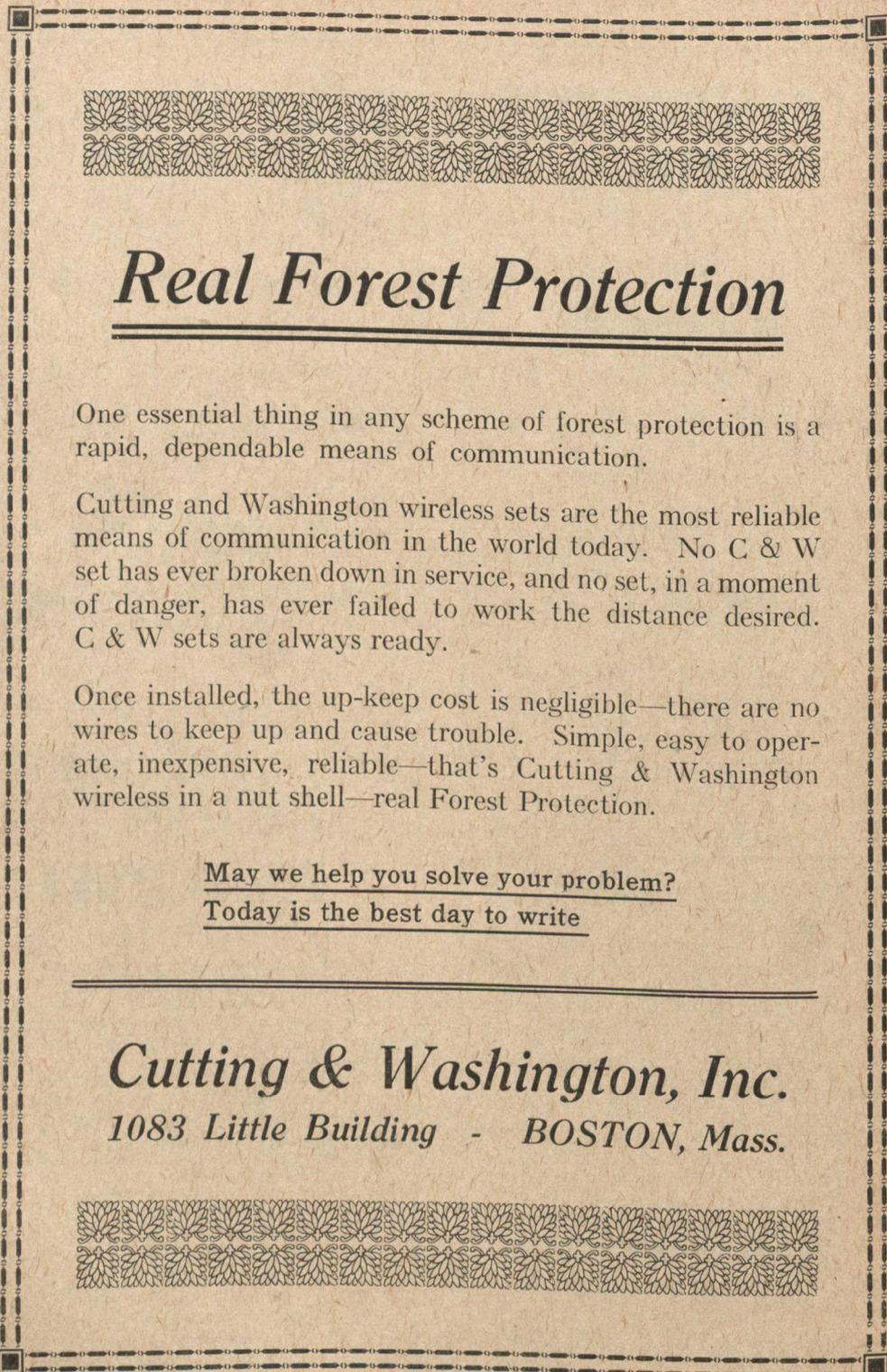
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