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Canadian Forestry Journal

VOL. XV.

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No. 12



A Midwinter Scene in a New Brunswick Lumber Camp



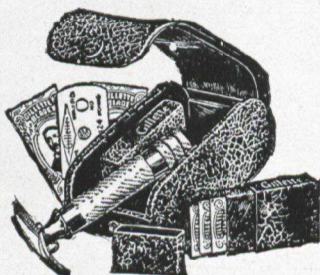
Field, Stream and Road

How strange the old-time pictures of sport would look today—baseball teams boasting at least half-a-dozen sets of whiskers—full-bearded cricketers—champions of the scull with their chins concealed.

Today the athlete knows the importance of the well-shaven chin. He is conscious that he is most keen when he is well-groomed—just as is the business man and the soldier.

For men who love outdoor life and sports, men of virile minds and active bodies, we have designed a Gillette Safety Razor with an extra stocky handle—the “Bulldog” Gillette, shown to the left.

Not that the Gillette needs a sturdy grasp. A light touch, with the angle stroke, removes the most stubborn beard with surprising comfort.



The “BULLDOG” Set includes oval Morocco Case with two blade boxes to match, and 12 double-edged blades.

But there is a certain appeal in the thicker handle of the “Bulldog”. Ask to see this special set and appreciate the point for yourself.

The case, you will notice, is almost as compact as the famous Pocket Edition Gillettes, and the price is the same, \$5.00.

Sold by all dealers catering to men's needs.



Gillette

Safety Razor

OUR TWENTIETH BIRTHDAY WITH TEN THOUSAND MEMBERS

The Canadian Forestry Association will be twenty years old on January 15th, 1920. On March 7th, 1901, the membership was 244, and receipts \$192.45.

At December 1st, 1919, the membership totals over 10,000, and receipts for the current year are about \$18,000. The Association has made a membership growth in 1919 of about 2,700.

The preliminary steps towards the formation of the Canadian Forestry Association were taken by Mr. E. Stewart, then Chief Inspector of Forestry and Timber for the Dominion (now of Toronto), who sent out a circular letter on January 8th, 1900, to a number of men interested in the subject of forestry, asking them to meet at his office on the 15th of that month. At that meeting were presents Sir Henri Joly de Lotbiniere; Saunders; Mr. William Little; Mr. Thos. Southworth, Director of Forestry for Ontario; Mr. E. Stewart; Prof. John Macoun, Assistant Director of the Geological Survey; Mr. Little was elected Chairman, and Mr. Stewart, Secretary.

ONTARIO MUST FACE THESE FACTS NOW!

By Robson Black, Secretary, Canadian Forestry Association.

As a matter of good business management, New Brunswick, Quebec, and British Columbia have placed the public-owned forest lands under a united and technically-qualified management. The Dominion Government also charges its Forestry Branch with the administration of all timber sale business on the Dominion forest reserves, in the west.

In Ontario, aside from fire prevention, the forest possessions are still handled on substantially the plan of 1890. Revenues are collected and a nominal supervision maintained over timber operations on licensed Crown timber lands, as conducted by private companies. But in the true sense of government management of public-owned property, from the viewpoint of so regulating cutting methods as to leave cut-over areas in the best possible condition to produce another crop, Ontario has yet to make a beginning.

FOR THE TAXPAYER'S NOTICE.

A very high percentage of the non-agricultural forest lands of Ontario are public-owned. The limit-holder is a lessee of cutting rights. His lease or license is renewed annually. He owns little or none of the land on which the timber grows. By retaining the land title, the province has always reserved the authority to impose such regulations as might be considered essential to the public interest. It is significant that the public management of forests in On-

tario—aside from fire protection and changes in dues—has not altered materially since the early days of exploitation.

Bearing in mind the state's admitted responsibility and legal authority in conserving the public forest wealth, some further facts demand consideration:

The greater part of the provincial land area is non-agricultural. Its productive ability is limited, therefore, to timber growing, mineral development and game production. Roughly, this classification applies to the vast region north of a line drawn from Ottawa to the southern shore of Georgian Bay, with substantial deletions here and there, as in the great claybelt area along the T. & N.O. and parts of the Canadian National Railways, parts of the Rainy River region and elsewhere. Northward and westward, to and beyond the height of land, Ontario possesses a natural timber-growing estate of incredibly large economic value.

HOW MUCH FOREST?

The productive forest area of the province is estimated at between 80 and 90 million acres, containing about 150 billion feet of merchantable coniferous timber, made up mainly of spruce, white pine, jack pine, balsam and tamarack, in addition to large quantities of poplar, birch, maple and other hardwoods.

The most authentic estimates give the amount of spruce and balsam available for pulp and



Ontario's great name in the world's lumber trade is built upon white pine. But the annual production of white pine on Crown Lands has fallen 60 per cent in the last ten years.

paper manufacture as 200 million cords (100 billion feet, board measure); and white pine as 20 to 25 billion feet.

While such chains of figures may reasonably impress the layman with the tremendous richness of Ontario's forests, false conclusions

should not be drawn. The forest resource is far from "inexhaustible." This year two new paper mills of enormous capacity have been put under way in Ontario's timber zone, and others are projected. The future will see a remarkable development of paper manufacture within

IS ONTARIO PREPARED TO ACT?

The Canadian Forestry Association has laid before Hon. E. C. Drury, Prime Minister of Ontario, a plan for the reorganization of the provincial scheme of forest management. It involves two major changes:

The transfer of the entire woods administration to the control of the Provincial Forester and a staff of experienced technical men. This would concentrate the management of the forest resources in the hands of a single branch, technically qualified for such important duties;

It would provide for carrying on a public duty for which no provision to-day exists, viz: the supervising of timber cutting and the ensuring of permanently productive forests.

Secondly, the appointment of a Forest Advisory Board, similar to the New Brunswick Board, consisting of three Government members and two representatives of the wood-using industries, to have full authority over the selection and appointment of all fire-rangers, timber-scalers, and other employees, thus ridding the staff of patronage interference and securing discipline and efficiency.

There is not at the present time one technical forester in any administrative relation to the 15,000,000 acres of licensed timber berths of Ontario.

The suggested reforms in Ontario forest administration are not designed to upset ordinary commercial methods of logging, any more than they do in Quebec, New Brunswick and British Columbia, where all timber operations are under control of the Provincial Forest Services.

The lumber and paper industries in Ontario are of vast economic magnitude and the utilization of spruce and balsam supplies for pulp and paper is only on the edge of a wonderful development. It behooves the Province, therefore, to insure the permanence of the raw materials of the living forest by better fire protection and better methods of logging. Permanence in the forest itself is the aim of good Forestry. The migratory forest, the transient sawmill, the effervescent lumber town are incidents of a primitive civilization and the absence of modern scientific method in handling timber areas.

Ontario is master of its conservation policies. The main areas of the more valuable timber lands are owned by the Provincial Government.

the provincial borders, owing largely to the great demand created by forest depletion in the eastern United States. The latter, once richly forested, are now so reduced by forest fires and industrial exploitation that there is not a ten years' supply of spruce for the existing mills and no possibility of new pulp enterprises getting under way. It is estimated that the United States clears off 20,000 acres of timber a day to meet its requirements and much of this is not being left in a condition to pro-

duce another crop in any reasonable length of time. Ontario stands to gain by this exhaustion of basic supplies south of the border, but the gain can be but temporary unless the management of Ontario's forests is guided by a constructive modern policy, looking toward the systematic growing of successive timber crops on non-agricultural lands.

THE MARKET SHOWS IT.

Again, the presence of 20 to 25 billion feet of white pine may appear a large supply. Yet

the fact remains that the scarcity of accessible white pine is so marked in Ontario that prices have now risen to \$80 to \$100 for a thousand feet, board measure, of pine strips, attributable not alone to production cost increases, but to scarcity of raw materials, not only in Ontario but elsewhere. Many of the large pine manufacturers in Ontario have placed a limit of three to five years on their pine log supply. Nearly 100 million feet less pine timber was cut from Crown lands in the fiscal year of 1917 than in the year previous. Labor shortage was undoubtedly a factor in this, but a long series of years presents a sharply decreasing return for the amount of pine timber cut. Ontario Government statistics show that the cut of pine from Crown lands was around 790 million feet in 1907, 630 million in 1908, 383 million in 1914, 308 million in 1908, 208 million in 1917, and 223 million in 1918. The year 1916 was the last in which white pine square timber figured in the official returns, when it was but slightly in excess of one million feet, as against over 12½ million feet in 1907. In the early days, square pine timber comprised a high percentage of the timber cut of the province, and formed the foundation for Ontario's reputation abroad as a great timber-producing region. These figures show a steady but rapid decline in the cut of pine, which can only be accounted for on the whole, by correspondingly diminishing supplies. This reduction in the cut of pine is, of course, offset by greatly increased cuts of spruce, balsam and jack pine. The change in the character of the operations is significant of the change which is taking place in the character of the forests, the more valuable coniferous species giving way to the less valuable, and these in turn, in many sections, to the hardwoods. A reduction of nearly two-thirds in the cut of pine between 1908 and 1918 is so significant of the deterioration in the quality of Ontario's forests that it challenges the most serious consideration. As in New Brunswick, where pine has fallen from absolute monopoly of the annual cut to a poor sixth place in the present-day volume, so in Ontario the elimination of the pine forests and the pine supply that plays a mighty role in provincial commerce may be accomplished within a few years.

WHERE ONTARIO STANDS.

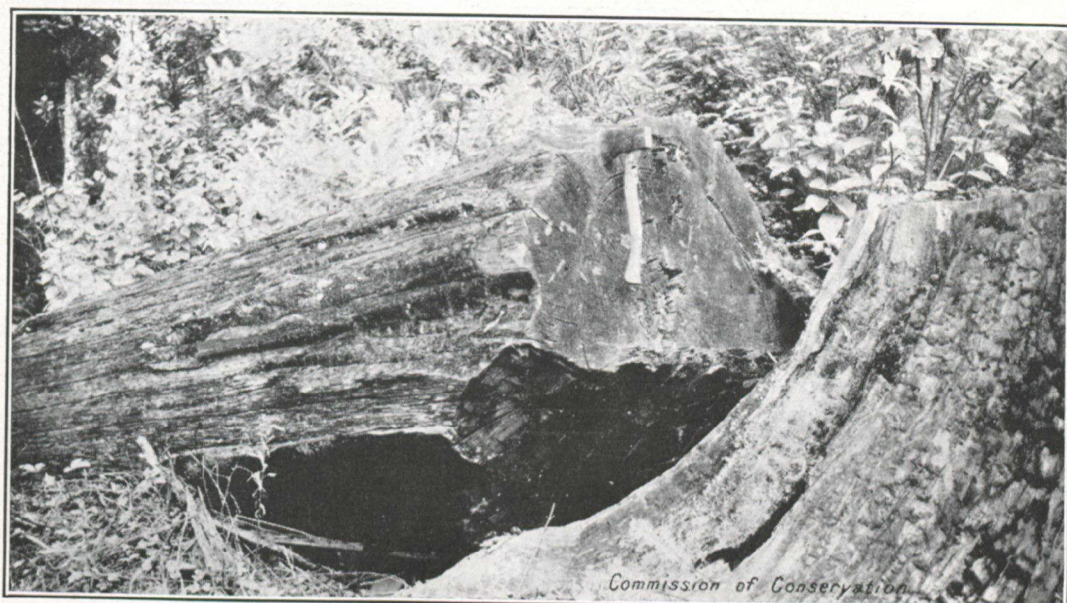
As with pine, so with spruce, and other species, the supply can be maintained only by applying the public authority to methods of private exploitation on Crown timber lands. In Ontario at present, such public authority is

practically valueless for the reason that the entire area of berths, roughly 15 million acres of our finest timber, is subject to only a few regulations which look primarily to the collection of revenue, rather than to the perpetuation of the forest as a source of supply. In only a comparatively limited number of cases is there any restriction as to the size of trees to be cut, and only recently and in a very small number of cases is there any provision for the enforced disposal of logging slash as a fire-preventive measure. Ontario's choicest forest sections are handled by the Department of Lands and Forests purely as a bit of revenue collecting. (The 1917 collections from timber dues and fire tax amounted to over \$1,695,000.) In the highly technical department of forest management, Ontario has not yet utilized one technical forest engineer and has attempted no extensive investigations of its forest lands with a view to their productive maintenance and no revision of ancient regulations along the lines of constructive forestry. The department maintains a forester primarily for fire protection work and tree planting, rigidly excluding specialized forestry knowledge, or any forest conservation plan from its handling of the timber berths. This plainly ignores the practice of nearly every forest-owning government in the world. It is opposed to the successful examples of New Brunswick, British Columbia and Quebec, where all branches of public management of the forest resources are under the single authority of the Provincial Forester and a staff of technically-trained inspectors.

The efficient handling of any state-owned property is direct consequence of a well-tested system and a well-skilled staff. The Ontario system of "handling" the fifteen million acres of timber berths under lease at the present time is as follows:

WHAT A "LICENSE" MEANS.

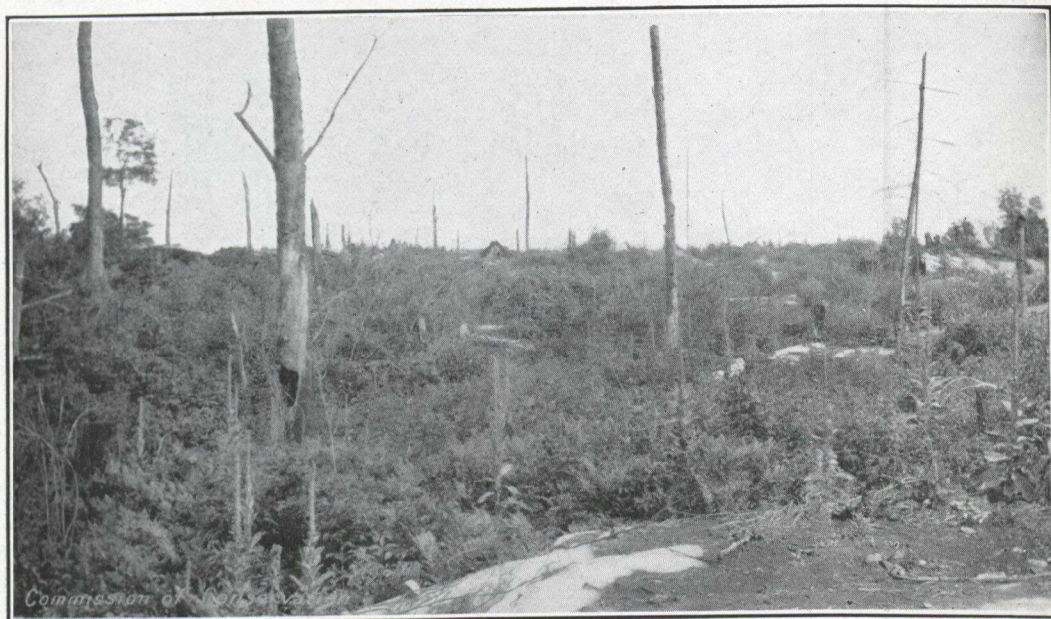
The berths are under annual lease. The lessee pays direct to the Department of Lands and Forests annual ground rent of \$5 per square mile, a fire protection tax of \$6.40 a square mile; fixed stumpage dues of so much per thousand feet, per cord, or other unit of measurement, and a bonus per square mile or per unit of measurement, the amount of which is determined by competitive bidding after the limit is advertised for sale. For example, while the fixed stumpage dues on white pine may be only \$2 per thousand feet board measure, the bonus offered by the purchaser of the limit has, in some cases, brought the total stumpage pay-



A white pine log cut in Ontario 23 years ago and left in the woods as "defective," according to the standards of that time.



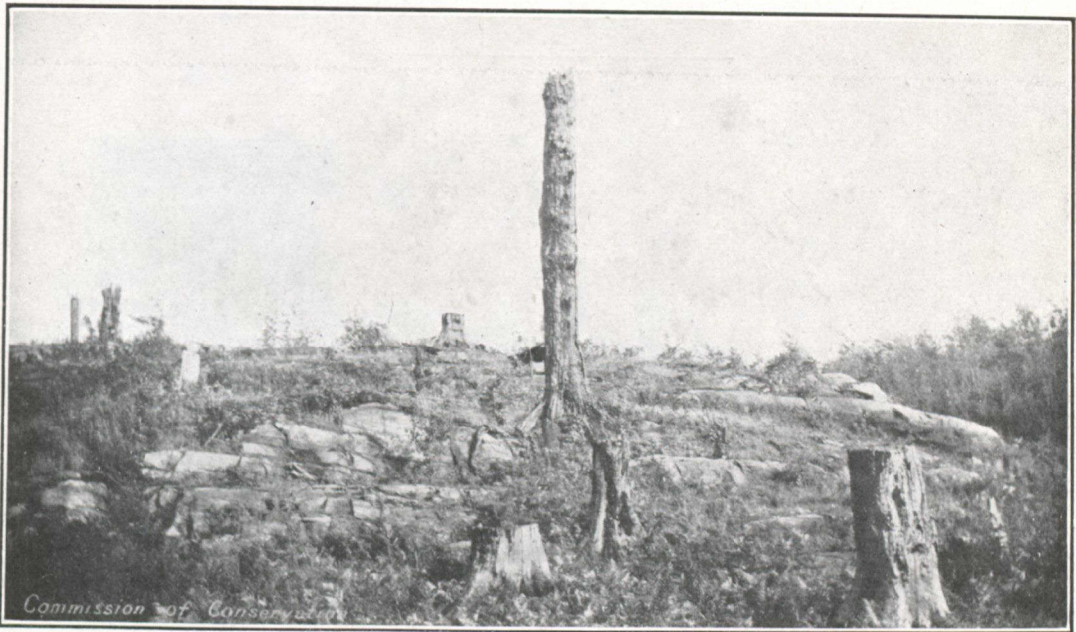
The log harvest that draws \$40,000,000 a year for Ontario's lumber production alone. Note size of logs to-day compared with the top picture.



An abandoned gold mine in Central Ontario. View shows a former pinery that once grew 60 merchantable pine trees to the average acre. To-day a vast area in this section is a No Man's Land.



Nature made a commercial forest here. Man made a barrens.
Photo taken on the Trent Valley watershed, Ontario.



Once a great pinery in Middle Ontario. To-day, the effects of forest fires have turned the area into a useless waste.

ment up to as high as \$24 per thousand feet, for particularly desirable and accessible white pine. Fixed stumpage dues for spruce saw logs may be \$2 per M.; for spruce pulpwood, 20 cents to 40 cents per cord, and for balsam pulpwood, 20 cents per cord, all of which may be materially increased on account of the bonus tendered by the successful purchaser. The dues are collected by the Crown Timber Agent in each of the divisions. He in turn works through timber scalers.

To renovate the existing system, managing a valuable part of the public estate by introducing proved business methods in the collection of stumpage dues, suggests no interference with the essentials of commercial lumbering. It undertakes only a more business-like handling of the situation, coupled with the development and adequate enforcement of intelligent and practical regulations calculated to leave cut-over areas in a condition to produce a new crop of timber.

(To be continued.)

WIRELESS PHONES IN MANITOBA.

Winnipeg, Man.—Churchill, Norway House, Grand Rapids, and all isolated settlements will be brought into touch with civilization through the winter, if the recommendations of Com-

missioner R. C. Wallace for the wireless telephone system for Northern Manitoba are adopted by the Manitoba Government.

Hon. Edward Brown, Attorney-General, said it would mean that the whole of the "added territory" will be connected up. The system will cover a territory of more than 175,000 square miles and will prove of immense value.

MR. KUHRING PROMOTED.

Mr. Gustave F. Kuhring, B.Sc.F., from the University of New Brunswick, has resigned his position with the New Brunswick Forestry Service to accept a position with the Riordon Pulp and Paper Company, at Montreal, under their Forester, Mr. AbYberg. Mr. Kuhring commenced his forestry work with the Laurentide Company in 1913. He has over four years' service overseas to his credit, being wounded three times and honorably mentioned in despatches, and was engaged with the N.B. Forest Service on forest survey work since returning. Mr. Kuhring expects to leave Montreal early in January for an extensive dog-train trip into the North.

Mr. Kuhring is one of the several New Brunswick Foresters who have recently accepted responsible assignments with private lumber and pulp companies.



Several readers of the Forestry Journal have been kind enough to send in photographs of the "American Elm." This shows a beautiful specimen from the collection of the Central Experimental Farm, Ottawa.

MAPLE SUGAR PAYS QUEBEC YEARLY FORTUNE

By C. Vaillancourt, Quebec.

Thirty Million Pounds, Valued at \$7,500,000—Special Schools to Teach the Art.

The maple sugar industry has increased three-fold in Quebec Province during the last three years, mainly owing to the scarcity of beet and cane sugar, and the continual rise in the price of the product.

But one factor which has stimulated perhaps more than anything else the development of our sugar industry, is the sugar-making school. A number of sugar schools were established at various places by the Department of Agriculture and many demonstrations in sugar-making were given in all parts of the province by special instructors sent here and there, at the expense of the department.

There are three sugar schools in the province: One at La Minerve, Labelle county, another at Beauceville, Beauce county, and the third at Ste. Louise, L'Islet county.

Modern methods of sugar and syrup making are taught in these schools. Young men who desire to learn sugar-making or to perfect themselves in this industry have only to apply to the Minister of Agriculture, and on receipt of a letter of authorization, they may spend eight, ten or fifteen days at one or other of these three schools and get very practical lessons on the modern methods of making maple products.

The department pays the board of these students during their attendance at the sugar school.

Of course, in all these sugar schools modern evaporators and implements are used. Everything is kept in the greatest condition of cleanliness from the tank in which the sap is gathered to the can in which the syrup is put. The pans are washed every morning. Cleanliness is, of course, one of the most important essentials in the making of choice products.

Five instructors in sugar-making gave demonstrations throughout the province on the use of modern methods of sugar-making. The total number of demonstrations given was ninety-four in eighteen counties of the province.

At a certain date, which is arranged beforehand, the sugar-makers are called by the instructors in one of the sugar groves of the province. The instructor makes sugar himself, by using material which he brings with him. Then the makers may ask all the information they desire to have. Such demonstrations have been very successful wherever they have been held. It is assuredly the most practical way to teach the good methods of sugar-making.

Such demonstrations have been going on during the last four years and the results of this practical method of teaching are already seen, as this year the purchasers say that about 75 per cent of the sugar manufactured was first quality.

Of course, there remains improvements to be made, but we are happy to record the splendid results of the work already done and which augur well for the future.

The total crop of sugar in the province was not quite as large as that of 1918. In some districts, there was more sap than last year; in others the quantity collected was hardly one-quarter of that of the previous season. In the Eastern Townships and in the Quebec district, the season was very good and the sap of better quality than last year. On the other hand, in the counties of Portneuf, Champlain and the Three Rivers district the crop was very much below that of other years.

The exact figures are not known as yet, but the quantity of maple sugar manufactures in our province this year probably amounts to 30,000,000 pounds.

If these 30,000,000 pounds are valued at 25 cents a pound, which is far from an exaggeration, this makes a total of \$7,500,000. The crop of 1911 had been about 10,000,000 pounds. As may be seen by these figures, the industry has developed on a very large scale during the last few years.



THE PRINCE JOINS US !

The Prince of Wales is one of the latest recruits in the growing membership of the Canadian Forestry Association. A letter received by the Secretary of the Forestry Association from Sir Godfrey Thomas expresses the interest of the Prince in accepting Honorary Membership in the Association. "I should be glad," writes the Private Secretary to His Royal Highness, "if you would inform the Directors that His Royal Highness much appreciates this invitation which he is pleased to accept."

PLANTING UP A WOODLAND.

Lieut.-Col. J. W. Harkom, Melbourne, Que., a Director of the Canadian Forestry Association, and one of the most devoted supporters of the forest conservation cause, has never contented himself with anything short of active participation in forestry. This year Colonel Harkom undertook to improve his woodland property by planting two thousand white pine, European larch and Norway spruce, and next year will plant at least five thousand seedlings. These have been planted in the openings from which mature timber has been cut. Colonel Harkom has found that about 85 per cent of the planted stock survives.

ATTENTION PLEASE

This Affects Every Member of the Canadian Forestry Association

Every recipient of this issue of THE CANADIAN FORESTRY JOURNAL is a member of the Canadian Forestry Association.

THE JOURNAL is the Association's line of communication between the executive staff and the fast-growing membership. But after all, THE JOURNAL is only incidental to your personal effort in the national cause of forest conservation. To you the publication may be good company, but the real spear head of constructive propaganda is the Association itself, its vigorous groups of members in a thousand towns, its lecturers, its successful campaigns to secure better laws and administration, its Railway Forestry Car; its motion pictures; its publicity bureau.

The Journal has its own worthy place, but the power that performs actual aggressive educational service is the organized membership working through a small executive staff at Ottawa.

We cannot emphasize too strongly that the Association is not a Government Department or an appendage to any commercial body. It represents Community Interest in forest conservation; it represents you as a Citizen.

We take for granted, you'll stand by the Association in 1920. It ought to be the greatest year in our history. Remarkably few men drop membership from year to year.

WHERE YOUR ANNUAL FEE GOES.

The Forestry Journal used to be a 16-page pamphlet. In those days the membership fee of one dollar paid the printer and left a fine surplus for the general work.

To-day, the printer takes every penny of your dollar fee for the paper and printing cost of our present publication. Advertising revenues are negligible. We do nothing more with the total of membership fees than to pay publication costs. And 1920 paper and printing prices will be even higher.

(over)

AND SO WE ASK—

in order to pay the printing cost of your personal copy of the Forestry Journal, and put some muscular power into your "Membership" in the Forestry Association, that you accept the following new basis of annual membership:

1920 Membership fee in the Canadian Forestry Association.....	\$1.00
1920 Subscription to the Canadian Forestry Journal	1.00
Total for Membership and Subscription	\$2.00

That is, we separate the Journal subscription from the membership, both of which were formerly included in the fee of one dollar. They now become one dollar each.

By the new arrangement, **any one paying one dollar will receive the Forestry Journal, 'as formerly.**

By paying two dollars, you get a year's subscription to the Journal, and in addition you make your personal alliance with the Association a real working force. That second dollar is the vital one in our educational campaigns.

(No one who has paid his fees for 1920 or who took out a 1920 membership on the basis of a one-dollar inclusive fee will be affected by the foregoing.)

THREE REQUESTS—THREE DUTIES

1. Do not quit the Association. Its battles are only half-fought.
2. Send in a dollar bill for your Forestry Journal.
3. And at the same time add a second dollar to pay for your Membership.

Yours faithfully,

CANADIAN FORESTRY ASSOCIATION

10,000 members—15,000 soon.

PROGRAMME FOR PRIVATE FORESTRY

By *H. S. Graves, Chief Forester of the United States.*

In seeking a solution for the forestry problem on private lands, it should be recognized that its very character is such as to require public participation, assistance and direction. There are certain things that the public should do, and in a liberal spirit, to make forestry by private timberland owners possible and effective. At the same time the public should insist by adequate legislation that the destructive processes be stopped, and that methods be adopted which will leave the forests in a productive condition. To secure these ends there is necessary a broad programme that is practical and equitable, based on consideration of existing economic conditions. Its formation calls for the most careful constructive thought, with no point of view neglected.

Some principles may, however, be briefly indicated. A programme of forestry should include, first of all, compulsory fire protection;

and this should apply to second-growth and cut-over lands as well as to old timber. State laws should be unequivocal, with adequate penalties in their requirements upon timberland owners for protective measures, including the prevention of dangerous accumulations of slashings. Fire protection should be organized and under state supervision. The states should provide an effective organization to enforce the fire laws and to administer the organized protective work. Liberal funds should be made available for patrol, improvements, supervision, and inspection. In most of the states the laws are not drastic enough; there is not sufficient direct responsibility on the owner, and there are not provided adequate means to execute the laws and administer the protective work. The damage by forest fires can be stopped. Its continuance is due to a combined failure on the part of the public and the owners.



The density of timber growth on the lower slopes and valleys of the Vancouver Island ranges and the western side of the Coast mountains is well depicted in the two pictures. First, a Cedar forest; second, a Douglas Fir forest. British Columbia contains about one-half total timber of Dominion.

TORONTO GETS A TREE NURSERY.

Parks Commissioner Chambers of Toronto has received authority from the Committee on Parks to negotiate for the purchase of a nursery farm of some thirty acres in the vicinity of the city for the propagation of seedling trees and shrubs to be used in local parks.

Land in the counties of Halton and Peel, the commissioner reported, was most suitable for the purpose, and could be purchased at from \$650 to \$1,300 per acre. He estimated that the establishment of a nursery farm would involve an expenditure of approximately \$35,000 and would yield the city a profit by the end of four years.

STEEL CARS SHORT-LIVED.

The Railway Review editorially says:

"When the steel car was introduced the idea became current that the life of a car so constructed would prove to be a pretty definite quantity, much exceeding the life of wooden equipment. For years it was professed that the life of the steel car was unknown from the fact that no such cars had actually passed out of existence through legitimate wear and tear and, naturally, it was something of a shock to have the committee above referred to come in with a report that the life of steel cars was but 13.1 years and that their scrap value was but 12 per cent of the original cost."

The committee in question made its report at an annual convention last June as a result of a canvass which showed that 953 steel cars had been scrapped after the average service stated. The Railway Review lays the blame upon the fact that iron is not as pure as it used to be.

Wood is, however, the same old reliable material as of yore and the above figures appear to indicate that there apparently is still some hope for the continued renaissance of the wooden car, following its resurrection during the war period as an emergency measure.

—*American Lumberman.*

ASH WOOD IN ITALIAN AVIATION.

In making the frames and wings of aeroplanes and airships in Italy, preference is given to ash wood because its fibres are fine, compact, strong and with few knots. Ash grows well in the south and centre of Italy, in loose, slightly moist, or even dry soils. Its trunk is straight and exceeds 65 feet in height.

THE POINT OF VIEW.

By Douglas Malloch, the Lumberman Poet.

I guess it is all in the point of view—

That a joy's a joy or a pain a pain,
That a thing is easy or hard to do,

That the heart will sing or the heart complain,
According to how it appeals to you.

There's a little house by the P. R. R.—

I bet you have passed it lots of times
As you sat alone in your parlor car—
Perhaps you noticed the ivy climbs
To westward side where the roses are.

Yes, I know you have. That's an ivy vine

That you seldom see in a land so young,
I planted it back in '59,

And for sixty years like a friend it's clung
To this little old wooden house of mine.

And the roses, too, you must have seen—

Two perfect ones by the open door
As pink as the cheeks of a fairy queen.

On the southward side there are seven more,
White, yellow, and all the shades between.

And here I water and tend and prune

And watch and gather and fool along
And know about all there is of tune

And hear about all there is in song—
And that's a heap in the month of June.

I figure you see me, riding by,

You busy man with your big affairs,
And think what a life to live, to die

Of all of the wide world unawares.
But it's all in the point of view, say I.

You may pity me. It's a funny thing,

But I never pity myself at all:
I stir the ground when the robins sing,

And then it's summer, and then it's fall,
Along comes winter—and then it's spring.

I guess it's all in the way you see,

I guess it's all in the view you take;
And you needn't sorrow or sob for me

When you think of the millions that others make,
For I'm not as poor as I seem to be.

FORESTRY'S BIRTHDAY 1000 YEARS AGO

Prof. Filibert Roth.

According to Fernow's History of Forestry, and others, France appears to have taken a lead in real forestry when Charlemagne, the first great king of the Franks, more than a thousand years ago began the protection of forests and the regulation of their uses. As early as 1291 there were regular laws applying at least to parts of the forests and regular official foresters. In 1402 a general law was promulgated by the king. In 1669, after eight years of labor by a commission of twenty-one experienced and informed men, the Minister Colbert, of Louis XIV, promulgated the famous forest law, "l'Ordonances des Eaux et Forets," which at that time was the most complete forest law in existence. This law provided a very full machine for its enforcement; every important cut of timber had to be marked out by state officials; it prescribed the minimum age at which to cut timber, set forth officially the seed tree method, "methode a tire et aire," etc.

In practice this law became irksome tyranny; it made grafters and bad men instead of interested foresters; it led good people to use bribery and other low means to escape its action. It hindered forestry in its development.

The motive was excellent, the organization, on paper, was perfect, the law did much good as well as harm, and its failure lay in ignoring justice and freedom of action, and in disregarding the initiative of the owners of the land and the peculiarities of the business. The commission failed to see that the details of handling a forest can no more be prescribed by law than the running of an ordinary mixed farm. In 1791 all was thrown overboard by the revolutionary government. But in 1803 Napoleon re-established the old regime, much modified, to be sure, but included a definite clause which forbade all forest clearing without permit.

In 1827, after things in France came to rest, a new law was established. This law of 1827, revised in 1859, practically re-established the law of 1669; left out the unwise prescriptions as to silviculture, but kept the order of 1803, so that to this day the old law of 1669 holds and the forests of cities, towns, and all public bodies are under the state authorities; private forest may not be cleared without permit and

may not be devastated, but any area cut-over must be restocked within three years.

Germany has gone through about the same experiences, but since it never was a single state, but remained in its more or less feudal form of a loose union of many states in which every lord and prince, every bishop, and every city or town had its own authority, there never was a single uniform forest law for Germany. In most states, and with most large forest owners, city or prince, the first regulations or orders forbade clearing the forest and forest devastation. Later on these were amplified by each owner for his particular locality. In some states the French revolution brought radical changes, as in Prussia where all private owners of forests were allowed by the law of 1811 full freedom to cut and clear and handle their property as they saw fit, while in other states, like Bavaria and Wurttemberg, the older laws, dating back to about 1500, were retained and are practically those in force today.

BRITAIN MAY BUILD WOODEN HOUSES

A special cable despatch from the London, England, correspondent of the *Montreal Gazette*, states that the probabilities are that Great Britain will adopt wooden houses as a solution of the acute housing problem in that country. The cable further states that F. C. Wade, agent general for British Columbia, has offered to have 500 wooden houses delivered in Great Britain and ready for occupation by Christmas. While there is a certain amount of opposition in certain quarters to wooden houses, it is significant that the by-laws prohibiting the erection of wooden structures are being amended. If wooden houses are finally adopted by Great Britain it will mean an immense boom for North American lumber.

—*Southern Lumberman.*

AN ODD STUDY OF TREE STUMPS

Grafted Roots Form Underground Pipe Lines to Keep Alive the Defoliated Trunk.

By C. C. Pemberton, Victoria, B.C.

The overgrowth on stumps of Douglas and Grand Fir is a very noticeable feature in the woods of the vicinity of Victoria, British Columbia, and first attracted my attention many years ago.

Believing that foliage was necessary to maintain life in a tree and always finding these stumps more or less in the neighborhood of other standing foliage trees of the same species, I concluded that a union of roots between the stumps and tree was the cause.

When, however, a few years ago, I began to assemble photographic studies of characteristics of our native trees for the Natural History Society of British Columbia, one of the first things I sought to learn through correspondence with authorities on the subject was the ascertained, scientific explanation of the matter. Many conjectures and opinions were expressed, but not a single account of actual investigations was given.

Among foresters, lumbermen, farmers, etc., to whom I first spoke and who had observed these stumps, the prevailing opinion seemed to be that the growth of new wood was caused by reserve material in stump, and the idea of its being due to root-union was doubted.

Many botanists to whom I wrote and sent photographs, held that the callus formation was due to reserve material in the stump, while others again expressed the opinion that such vigorous growth was impossible without foliage or root connection with a tree possessing foliage.

A EUROPEAN VIEW.

The first person from whom I obtained authentic information was Professor Somerville, of Cambridge University, to whom Mr. James R. Anderson, of Victoria, had sent some of the photographs of these stumps.

In a letter to Mr. Anderson, April 23rd, 1919, he says (referring to these stumps):

"This is the condition of things we often find in the larch in Europe, which, of course, is a deciduous tree, as contrasted with the evergreen character of the Douglas fir. So far as I have observed, the larch is the only conifer indigenous to Europe, which fre-

quently shows this condition of things, and it is usually attributed to the inarching of roots of adjoining trees, the stump of one that has been felled, procuring a good deal of nourishment from the roots of one or more adjoining trees that have been left growing.

"I do not know that this subject has been exhaustively investigated, but it would be interesting to make an examination of a large number of larch trees which have stood well removed from other individuals of the same species and which have been felled some years before. In such cases, one would not expect callusing of the stools for, if the theory is well founded, it is only where other trees of the same species are left to grow in the immediate neighborhood of one or more that has been felled, that one would expect to find this phenomenon.

"That the roots of trees in a wood grow together to a large extent is an undoubted fact, and the photographs that you have submitted show this very conclusively. Of course, one can have a certain amount of growth taking place in a stem which has been severed from the stump, provided the stem is laid in a cool, moist place, in which event the cambium becomes active in the spring, and ten per cent or more of an annual wood-ring can be formed in the ensuing season. I have found this notably in the larch, but I doubt not it occurs in other species."

MR. PEMBERTON'S FINDINGS.

Whilst, as already related, I sought information through correspondence with authorities, I also took every opportunity of investigating the characteristic of overgrowth of stumps as well as that of the frequency and cause of root-union.

I examined a multitude of overgrown Douglas and Grand fir stumps in the vicinity of Victoria, not only those in which root systems were already exposed to view, but by uncovering many others with root systems deeply buried in the soil.

I searched also for intermingling of roots and evidences of frequency of root-graft in neighboring areas where stump pulling and land clearing operations were taking place, and carefully inspected many spots in the local forests in which intermingling of roots was to be seen. While overseas I had especial opportunities of noticing whether in intermingling of roots, in-arching and root grafting occurred among conifers, since in England and France, the stumps were usually removed after the felling of the trees. The results of these observations and investigations seem to prove:

Firstly—that in some species root-unions, direct and indirect, with a tree possessing foliage, cause healing and overgrowth to occur on

the stump of the tree felled, but in other species do not do so. I have never been able to learn of or to discover a healed stump quite isolated, which thorough investigation did not prove to have direct or indirect root-union with a standing tree retaining its crown.

Secondly—that roots of the same tree or of a similar species of tree, can intermingle without intergrafting. Natural grafting, however, readily occurs through or by friction and pressure when roots of a single tree or of two separate trees of the same species are brought into contact by their increase in size, by elongation in growth, or where the tap-root of one tree in descending meets the secondary root of another tree spreading horizontally.



Here we see a stump of a California Sequoia tree wholly covered over with a cap of live wood.



Nature's way of healing over stumps of Douglas fir. As Mr. Pemberton's article explains, the growth is provided for by a graft of the roots of the stump with roots of a tree bearing foliage.



How trees are sometimes united by root grafts so that "dead stumps" continue to draw life from a live neighbor. This picture taken by Mr. Pemberton illustrates this natural curiosity very well. The stumps of Douglas fir have continued to grow a bark covering over the exposed wood. It will be seen how their roots reach into the foreground, grafting with those of trees fifty feet away.

MINING COMPANIES PLANT FOR PROPS

Harrisburg, Penna.—Hon. Robert S. Conklin, Commissioner of Forestry, stated to-day that the most promising development of the past year in the field of reforestation is the interest mining companies are taking in forest tree planting. Fourteen different companies already have committed themselves to the practice. During the past four years mining companies have planted over 450 thousand trees, of which number 250 thousand were set out during 1919.

Coal companies are beginning to see the value of reforestation. They are experiencing great

difficulty in procuring suitable mine timber at a reasonable cost, and they realize that it is now possible to grow timber of usable size on their own holdings, at present almost entirely unproductive, long before the supply of their mines will be exhausted.

Commissioner Conklin predicts that mining companies will plant at least 500 thousand trees during 1920, and announces that the Department of Forestry is co-operating with them by supplying the planting stock, and giving technical advice free of charge.

BRITISH ISLES READY FOR PLANTING SCHEME

London, England.—When the last of three-decker men-of-war ran off the slips British forestry died.

The oak forests, planted after Trafalgar for the express purpose of building Britain's wooden ways, stood untouched at the beginning of the war. When the overseas' supplies of timber were cut off, the country had cause to bless the men who unconsciously planted for an emergency greater than any which they could have contemplated.

Serious effort now being made toward afforesting Great Britain is the result of the hard lesson learned during the war, and is but one of many hopeful signs of the intelligent reconstruction visible here. Britain can never be self-supporting in the matter of timber, and, whatever success may attend the present endeavor, it is not likely she will import a single log the less for a generation.

But, thanks largely to the splendid work of the Canadian Forestry Corps, her woods are a picture of desolation, and, even before that most successful attack, the area under timber was only 4 per cent of the whole.

The proposal is to spend three and a half millions sterling in planting a quarter of a million acres during the next ten years, under centralized authority, possessing wide powers and capable of laying down a well-defined, far-reaching policy.

Britain has never had a real forestry department, and one of its advantages will be that edu-

cation in forestry will be greatly stimulated, and a worthy career opened to experts.

The House of Lords, which has approved the scheme, knows more about such subjects than the commons, and it is hoped no serious opposition will be encountered in the Lower House.

PULP SCARCE—INQUIRY STARTS.

Washington, D.C.—Scarcity of wood pulp in the United States is becoming so serious that Congress will make a survey of the industry, Senator Gronna, chairman of the Forestry Committee, announced. A superficial survey of the paper industry by the committee shows that many daily papers, especially in the smaller cities, are unable to secure necessary print paper, and that the paper which is available has increased in price to such an extent it is difficult for small papers to continue at a profit.

BLACK WALNUT PLANTING

One hundred and fifty bushels of black walnuts were planted this fall in the Mont Alto nursery, Penna. The seed was good in quality and should produce 100,000 seedlings for planting next year. Most of the trees will be distributed to private planters throughout the State, who are anxious to start groves of this valuable tree, the wood of which was in such demand during the war.

THE VALUE OF PRAIRIE WINDBREAKS

By M. J. Stevenson, Morris, Man.



One thing that is very conspicuous by its absence on a great many of our prairie farms, is a good wind-break or shelter-belt.

There can be no question about the benefits to be derived from such planting—both in winter and summer.

If there is a more desolate picture than a farm home situated out on the bare prairie, unprotected and besieged by the fierce storms of winter, I have failed to see it. Turn your stock out amidst such a scene, when the wind is blowing a gale, and they stand shivering till they are put back in the stable again. It has been demonstrated times without number that ten below zero with the wind blowing a gale, is worse than forty below without wind.

The moral is: Plant trees, and lots of them, around your farm homes, and you will never regret it.

In a great many instances people have lived on the bare prairie for twenty or thirty years without planting any trees; or, if they have made the attempt, it has ended in partial or total failure, due in most cases to poor methods of handling or subsequent cultivation. Think of the beauty and comfort they might have been enjoying all these years had they planted intelligently when they first settled. And this would have been a vastly different looking country to-day.

In order to be successful, the beginner on the bare prairie must plant only those trees that have proven entirely hardy, such as the Russian willows, box-elder (or Manitoba maple), green ash, white elm, and white birch. Plant these hardy trees on the outside of your proposed plantation, and after they have grown a few years and have become somewhat of a shelter, plant, on the inside, at least a few rows

of some of our hardier evergreens, such as the white spruce, Colorado blue spruce, jack pine, lodgepole pine, Scotch pine, balsam fir, and native cedar. For, after all, there is nothing like the evergreens either winter or summer. In planting evergreens do not plant them closer than twelve or fifteen feet from the deciduous trees, or they will be overshadowed and will not do well.

In order to produce best results, your wind-break should consist of at least a dozen rows of trees on the north, west and south of your farm buildings, leaving it open to the east. Be sure you leave yourself sufficient space within the enclosed area for your farm buildings. If you plant your trees too near the buildings, they will catch and hold the snow where it is not wanted. In my experience it is always best to plant three or four rows of willows about one hundred feet north, west and south of your proposed plantation. This will catch and hold the snow in the intervening space; consequently your inside trees will not be broken down by the weight of snow, a circumstance which quite frequently happens. This open space between the trees will make an ideal garden or potato patch.

PREPARATION OF LAND.

It is of utmost importance that we have our land in first-class condition before any planting is done. Just here is where most of the failures in tree-planting on the prairie have taken place. Remember moisture is the factor that spells success first, last, and all the time. We must strive to conserve all the moisture we can in the soil, both before and after planting. There is nothing quite as good as a well worked summer-fallow, plowing it as deeply as possible. I find it pays to summer-fallow two years in suc-

cession before planting. --Never, under any circumstances, should any planting be done on soddy land or in stubble. Be sure your land is comparatively free from weeds of every description before planting, as it is much easier to get after this pest before than after planting.

METHOD OF PLANTING.

In all our planting for wind-break purposes, we should aim to get forest conditions in our plantation as soon as possible. Consequently we should plant the trees close together at first, so they will completely shade the ground in the shortest possible time. From thirty years' experience in tree-growing in this climate, I have found that about four feet each way is the right distance apart to plant at first. After they begin to crowd, some of them can be removed, but right here is the severest test of the forester's skill in knowing what trees to remove and what to leave. Never open up your young forest so that the sunlight can strike directly on the forest floor, as weeds and grass will start to grow, and this will be the beginning of the end of your young forest.

I have always had the best success when using young stock in planting—about two-year-old seedlings of the green ash, white elm and maple. As all the willows grow readily from cuttings, it is not necessary to have rooted stock for planting.

Always carry your plant material in pails, partly filled with muddy water and never allow the roots to become dry. You must take special care in handling all evergreens in this respect as a few minutes exposure to the sun and wind will kill them. Always plant your trees an inch or so deeper than they stood in the nursery, and be careful to pack the earth very solidly about the roots. A little care just here will often make the difference between success and failure.

Your trees should have thorough cultivation, and be kept free from weeds and grass until they completely shade the ground, when forest conditions will be established.

Build a good substantial fence around your forest to keep out all stock. Remember, there is no room for a successful tree plot and farm stock on the same piece of land. There are a great many natural groves in the west to-day being ruined by this practice. Take good care of your young shelter belt and in a few years you will think it is the most valuable asset on the farm.



A NEW BRUNSWICK ELM.

Mr. Hunter White, Secretary of the New Brunswick Wholesale Grocers' Guild, writes the *Forestry Journal*, enclosing the above photograph of an elm growing at Lower Norton, near Hampton, N.B., on the Kennebecasis River. Quite truly Mr. White remarks: "We have an idea that elms do not grow finer in any other place in the world than in New Brunswick."

MAKING WHITE PINE GROW.

Mr. Hill, lockmaster at Buckhorn, Ont., experimented with a pine tree to determine improved growth which may be secured by proper care. Fifteen years ago, he pruned all the lower branches off a 4-inch white pine sapling, removing other saplings from its vicinity, dug up the earth around it and applied manure to its base. It is now 19 inches in diameter at its base and has a long, clean bole. Thus, during the 15 years, the growth in diameter has averaged one inch annually.

CANADIAN TREE SEED FOR BRITISH PLANTATIONS.

Twelve hundred pounds of Sitka spruce seed have been collected by Mr. B. R. Morton, of the Dominion Forestry Branch during the summer's work near Massett Inlet on Queen Charlotte Islands, B.C. Each pound contains about 250,000 seeds. The entire shipment will go to the Board of Agriculture for Scotland and will be utilized by the British Forestry Commission for replanting purposes. The seed was extracted on the Island and was cleaned at Kamloops.

ITEMS FROM THE DIARY OF OUR EXHIBITION CAR

The Canadian Forestry Association's Exhibition Car, which is a travelling school in forest protection and the value of the forest possessions to the Canadian people, completed a short tour of the prairie provinces during October and November under the able direction of Mr. R. M. Watt, of the Dominion Forestry Branch, Dauphin, Manitoba.

Mr. Watt was forced to battle against inclement weather throughout the trip which, of course, interfered with public attendance. Nevertheless the journey accomplished a great deal of good educationally, and it is hoped will be resumed next season.

A few of the items from Mr. Watt's diary of the trip read interestingly:

Gladstone, Man.: Representative attendance from town as well as scholars with teachers, who showed keen interest in exhibit.

Swan River, Man.: Succeeded in getting 85 per cent of the people in Swan River to see the car. School children came with teachers.

The Pas, Man.: Public and separate schools and teachers and representative business men visited car and showed great interest. Splendid attendance.

Melford, Sask.: Raw cold day. Splendid attendance. Bankers and business men showed keen interest, also a number of people from the country.

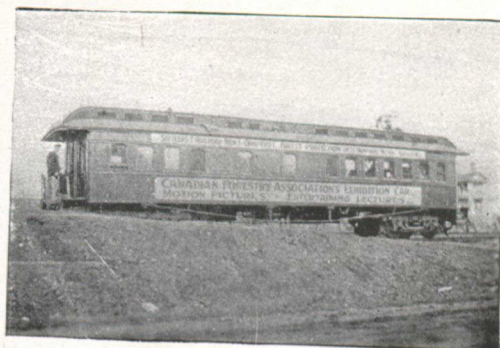
Shellbrook, Sask.: Arrived at noon. Excellent attendance.

Saskatoon: Busy all day and till 10.30 p.m. Good attendance, practically all business men.

Stettler, Alb.: Good attendance at car both from schools and town.

Big Valley, Alb.: Would say at least 95 per cent of population visited car. Between Big Valley and Munson had a number of visitors while train was running.

Drumheller, Alb.: Handled over 300 people, who were very interested.



And so the record continues.

Next season, the Forestry Association will endeavor to improve its Forestry Car by more elaborate construction of models and a more diversified arrangement of forest products. In fact, we hope to have two cars in operation, east and west. The Association's handicap in this important enterprise is purely one of finance, the present Forestry Coach, even with its limitations, having been outfitted and sent forth on its mission only with considerable difficulty as regards the provision of funds.

FROM WINNIPEG.

"I trust that the efforts of the Forestry Association may bear fruit. Few can realize the extent of the loss already sustained by this country in this matter, and it will take constant and untiring work to impress on those in authority and the public at large, whom they represent, the urgent need of a constructive policy."

G. B. McCOLL,
Land Surveyor and Engineer.

PREMIER DRURY ON FORESTRY.

From Toronto *Star* report of an address by Premier Drury before the Canadian Club at Toronto:

"A progressive forestry policy is to be inaugurated by the new Government with a modern scheme of reforestation. New Ontario must be wisely developed," he said. "In the past our treatment of forest resources has been criminal," declared the Premier.



Northern Ontario's Forest Wealth. A log jam along the T. & N.O. Railway.

THE LINE-UP OF LAND IN SASKATCHEWAN

The following has been worked out for the Canadian Forestry Journal as a reasonable division of the land area of the province of Saskatchewan, which totals one million acres:

One-third prairie, south of the main line, C.N.R.

One-third wooded, between main line of C.N.R. and Churchill river.

One-third barren, north of Churchill river.

This, of course, does not indicate absolute lines for there are considerable agricultural areas inside the wooded zone as well as a certain amount of natural forest land in what has been designated as prairie. However, the tabulation will stand as substantially correct, thereby indicating that only thirty or forty per cent at most of the entire province of Saskatchewan is adapted to agriculture.

Of the fifty million acres inside the central section south of the Churchill river, it would

probably be a most conservative estimate that 25 to 35 million acres are absolute forest land, quite unfit for farms. The present area of the forest reserves in Saskatchewan is six million acres which falls short of including even one-quarter of the provincial area that must be handled for timber production or be regarded as permanent barrens.

As illustrating the enormous reduction in the standing timber of Northern Saskatchewan it may be pointed out that only 750,000 acres out of 25 to 35 million acres of natural forest land are to-day bearing commercial timber. The economic effect of this reduction in raw materials has already been seen in the closing of the largest sawmills of Saskatchewan and the prospect of still further reduction of sawmill activities. It is estimated that when logging and sawing in Northern Saskatchewan was at its height about \$2,000,000 a year was circulated in pay envelopes and supplies through such points as Prince Albert.

THE UTILITY OF THE WINDBREAK

By Carlos Bates, in "Windbreaks, Their Influence and Value."

The term "windbreak" may be applied to any object which serves as an obstacle to surface winds. For the purposes of this study, however, it must be limited to bodies or rows of trees. Windbreaks may be divided according to their general arrangement into three classes: (1) rows and hedgerows; (2) belts or shelter belts; (3) groves, or, in the most extensive case, forests. A belt usually consists of three rows or more, but its width is less than twice the ultimate height of the trees.

In European countries the windbreak perhaps serves its greatest utility as a check upon drifting sands along the coast, especially in France. In the interior steppes of Russia, which correspond to our middle western plains, windbreaks have been planted more or less extensively to protect fields from the desiccating winds of the region. In Schleswig-Holstein earth walls are thrown up and shrubbery is planted upon them, since forest trees can not be made to grow there.

WHERE TREES COUNT MOST.

Although windbreaks are of very real benefit to the farmer and fruit grower everywhere, it is in the treeless, wind-swept plains that they find their greatest utility. In addition to the esthetic benefits and the general "improvement" value to the farm, it would in many instances be almost impossible to raise crops without protection from the hot, dry winds of summer and the cold, dry winter winds.

The early settlers realized the value of trees for protection and attained success in tree-planting under conditions which at first seemed very unfavorable. First, small groves were planted about the houses and barnyards. Gradually these were extended in the form of belts or single rows to protect the larger areas of orchards and fields. Where the soil was light it was necessary to prevent its drifting. The farmers soon found also that a windbreak was very useful in preventing the drifting of snow. Railroad companies made many desultory attempts to protect their tracks by planting belts of trees far enough away to serve as snow traps, but more frequently loose fences were used.

Orchards must be protected from the mechanical effects of the winds which strike the trees when they are laden with fruit; from their drying effect, which blights the fruit and causes it to shrink; and from the drying or "winter-killing" of the branches. This applies not only to the prairie states, but also to the lake states, the fruit region of California, and the Columbia river valley fruit region. In many sections of Michigan, Wisconsin, Illinois, Maine, and New York, where peach growing was formerly profitable, it is now impossible to raise consistent crops of this fruit, because of the increased exposure that has resulted from the removal of the original forests.

FOR WHEAT AND RYE.

It is necessary to consider also such winter crops as wheat and rye. For the protection



An irrigation lateral on C.P.R. lands in Southern Alberta.

of these the windbreak serves the double purpose of causing an even distribution of the protective snow cover and of sheltering the tender plants from the wind itself, once the snow has melted. The protection of all summer crops is important.

The protection of stock is a matter of no small importance in many of the western states, where there are large ranches with no more

adequate shelter for the cattle than that afforded by a grove of trees. Instances have been recorded where large herds of cattle have passed through a severe winter in the shelter of a cottonwood grove. Such a condition represents a low state of development in the economy of the stock business, but the usefulness of a windbreak for the protection of sheds and winter yards may always be considered.

CAN WHITE PINE DISEASE BE CONTROLLED ?

That the white pine, most valuable of American soft woods, can be saved, and not made extinct by the dreaded blister rust, was the consensus of opinion at the international blister rust conference in Albany, when experts from all parts of the country gathered to discuss means of stopping the spread of the infection. If proper care is taken to prevent its spread there is no reason why reforestation with white pine should be discontinued. Methods of treatment of the infected tree, but particularly of stopping the carrying of the spores to uninfected trees were discussed. Dr. L. H. Penning-

ton, head of the Forest Pathology Department of the New York State College of Forestry at Syracuse, told of important tests in the Essex county region, to determine the distance to which the disease could be carried, and he gave his opinion that the blister rust spores were able to carry the infection to a much lesser distance than has commonly been supposed, thus making the protection of uninfected stands of pine much simpler. He urged that the greatest care be taken, however, to completely eradicate the current and gooseberry bushes which participate in transmitting the pest within the danger zones.

THE PINES.

By Douglas Malloch, *The Lumberman Poet.*

Calm, unafraid, they face the storm,
The pines upon the hill,
The winter cold, the summer warm,
With an unaltered will;
And winds may blow
And waters flow
Or all the earth be still.

Their years are centuries, their lives
Span many lives of men;
And mortal fails or mortal thrives
Or mortal fails again,
But on the steep
Their watch they keep
O'er rock and rill and glen.

Would we might stand, as stand the kings
Upon the mountain side,
Above the level—little things,
Ambition, sorrow, pride;
Would we were these,
The giant trees
Whose souls have never died.

God give me strength to be a pine
And not to be a weed,
To lift my head and give no sign
However I may bleed—
To face the years,
To hide the tears,
To be a pine indeed.

SACRIFICE VIENNA FOREST

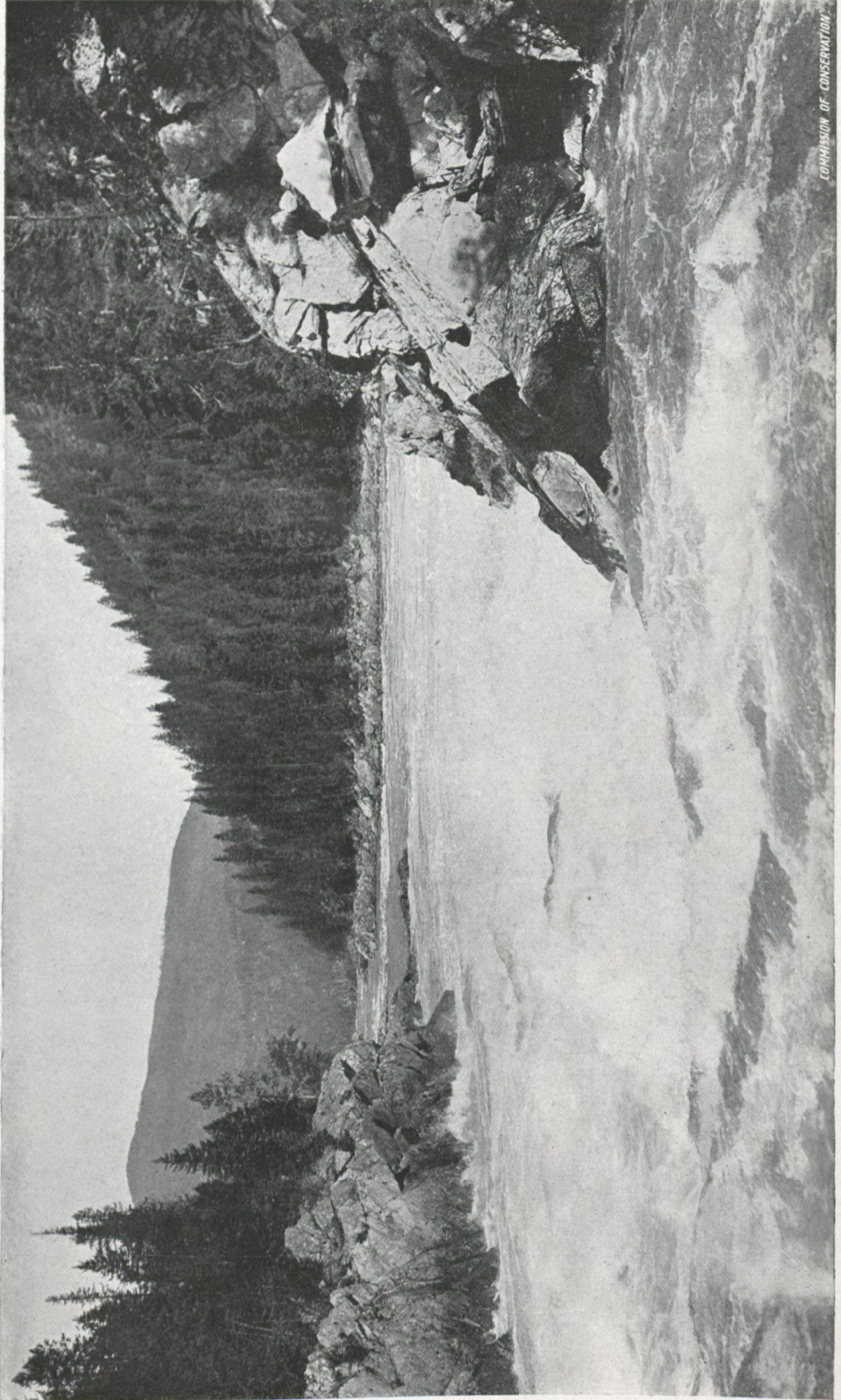
Paris, France.—The actual fuel shortage in Austria has resulted in mutilation of the famous Vienna forest by the desperate population, according to despatches from the Austrian capital. So many trees have been cut out that restoration of the forest is considered impossible, the despatch said. The government has been unable to restrain the people from obtaining fir wood from the forest.

BRITAIN'S PLANTING PROGRAMME.

According to official information received by the Canadian Forestry Association, the British Forestry Commission has now been appointed and the sum of three and a quarter million pounds sterling has been appropriated by the British Government for reforestation enterprises over a period of ten years. This allows approximately \$1,750,000 per annum. About 250,000 acres will be planted with forest trees.



A LOVELY TREE FOR CANADIAN GROUNDS IN WINTER TIME.
View shows a European Larch in December. It is particularly well adapted for home surroundings and parks.



COMMISSION OF CONSERVATION

On the Pen D'Oreille River, British Columbia.

PRACTICAL UTILITY OF PLANES IN FORESTRY

By J. B. Harlin, Commissioner of Dominion Parks.



Would an Equal Investment in Forest Wardens Achieve Better Results in Fire Prevention?



Practically everyone who has to do with forestry is convinced that eventually aircraft shall be extensively and efficaciously used in such work. Expectations in that connection concern two broad lines—the rapid and accurate collection of information in regard to the forests, extent and variety, topography and fire protection. Everyone is familiar with the wonderful detail and accuracy of the war maps prepared from aircraft photographs. Such accurate and detailed maps are absolutely necessary for the intelligent handling of Canada's forests. Such can be prepared by the laborious and expensive and slow land survey methods, but the airplane appears to offer facilities for securing perfectly satisfactory maps at a trifling cost and in a period of time measured in days instead of years.

However, it is in regard to fire protection that most is expected of airplanes. After all is said and done fire protection is the most important feature of forest work from the practical standpoint. No one will deny that reforestation of cut-over areas is essential if the annual yield is to be sustained. It is true, natural reproduction can be depended upon in some localities to replenish the denuded areas, whether denuded by fire or by man. Certain studies relative to the scientific management of the forest from a commercial standpoint are also necessary, but after all the practical man will recognize that fire being a constant menace, it is of no avail to reforest and carry on the various other steps in regard to scientific forestry if the organization of methods and appliances for protecting the forests—new or old—from fire are inadequate.

Forest fire protection to be adequate requires prompt discovery of fires, facilities for promptly transporting men and appliances to the scene of a fire, and finally adequate means of effectively extinguishing fires.

"CATCH THEM YOUNG."

Prompt discovery is a first essential. A forest fire in its incipient stage is comparatively

easily handled. A forest fire which has developed into a large fire is one of the most difficult problems a man can face. As to discovery, there can be no difference of opinion as to the utility of aircraft for this purpose. The methods now followed in connection with fire discovery are: The maintenance of patrols of men—afloat or mounted—and a constant observation of an area from look-out stations—either on mountains or on high towers. The use of aircraft undoubtedly will eventually supercede these methods. Each of these methods has its own peculiar advantages. The moving patrol can, as a rule, cover larger areas than a look-out; the look-out may do its work more intensively than the moving patrol, but its limits are definitely fixed by the topography of the country. Aircraft should be able to take the place of both these services. They combine the motion of the man patrol and the intensity of the look-out station. In effect, they will become moving look-outs.

The area which such a look-out station can efficiently cover can be measured in hundreds of square miles, while the area of a fixed look-out station, or a man, or a horse patrol can cover, is figured only in tens. Another item of superlative advantage is the altitude of an airplane compared with an ordinary look-out station. There are naturally very distinct limitations to the height that a fixed look-out can reach. There are practically no limitations to the airplane in that regard. The ability of the airplane to rise to great heights, it is true, enables it to overlook at all time a much greater area than that covered by a fixed look-out. Important as this is, it is, perhaps, not the greatest. Especially in the mountains, fires frequently make headway before discovery, because of high elevations intervening between the look-out or the patrolling warden and the fire, and because of the great variations in the direction of the wind, caused by the topographical features of the country. The worst fire in the Dominion parks this year was burning several days within a comparatively

few miles of a patrolling warden before discovery. There, unfortunately, was a high range between him and the fire, and the wind was so deflected that it was impossible for the warden to see the smoke. The first reports of the fire came from the prairies, miles away. From there the smoke was clearly visible. Even when the general location of the fire was known and fire-fighting gangs were sent in, these people could see no sign of fire until they were within a few hundred yards of it. Now, had there been an air patrol the fire would have been discovered the day it started. To a person unfamiliar with the mountains this story might seem almost impossible, but a most rigid investigation has established its truth.

THE SQUARED MAP.

Once a fire is discovered, the all-important matter is to definitely locate it so that the fire-fighting gang may reach it promptly. The "squared map," so much used in the war, offers facilities for an airman exactly locating a fire and passing on word to the fire-fighting organization, also in possession, of course, of a "squared map." And that means that the fire-fighters at once know where to go and how. This information may mean the saving of many valuable hours in the beginning of the fight against the fire and a few hours at that time may mean the difference between the destruction of a few acres of forest and the destruction of tens or perhaps even hundreds of square miles.

There is another important use of these maps in regard to fire-fighting. The maps give accurate information as to the conformation and physical features of the district. As already intimated, these have an important bearing on wind direction—a vital consideration in fire-fighting. These also constitute the chief considerations in the decision as to how a fire is to be fought. From an accurate map the fire-fighter at once knows whether the fire threatens specially valuable timber. He also knows whether there are any natural features, rocks, water, open areas, which can be used as a natural line of defence against the fire. This and other information he can get from the maps gives the fire-fighter the knowledge he requires in reaching a decision as to how to lay out his fighting forces. For it must be remembered that fighting a battle with a fire is like fighting a battle with human beings. Generalship is vital, and when a general knows all about the "lay of the land" where the battle is being fought he has information that may readily

mean the difference between a victory and a defeat.

SCOUTING A RAGING FIRE.

There are two other matters in connection with forest fire protection in which it is expected that aircraft may help materially—rapid transportation of men and supplies to the scene of the fire, and scouting operations during the progress of a fire. As to the scouting operations, these are of great importance if a fire attains any great size. A man who is directing fire-fighting operations in such a fire is always handicapped by lack of information concerning the developments of the situation. His staff may be holding the fire at one point, but losing ground at another. Topographical features and consequent variations often give a fire an unexpected turn. An airplane scout, observing the fire from aloft, can keep the chief fire-fighter constantly advised in that connection.

As to transportation of men and supplies, everything that aircraft can do in that regard will prove of outstanding value. As already stated, getting the fight started before a fire has gained too much headway is all-important. Getting fire-fighters to a fire even only ten or fifteen miles away is often a slow and laborious undertaking, for forest trails are not city highways, and, moreover, forest fires have a disagreeable habit of so locating themselves that the first struggle of the fire-fighters is to get over the steep grades and the masses of debris and to penetrate the thick forest growth between them and the fire. It is obvious that with ample landing-places throughout a forest, the airplane can very quickly take men and supplies to the scene of a fire.

ARE GAS BOMBS PRACTICAL?

It is to be hoped that the airplane will also prove effective in actual forest fire-fighting. At present the idea in this connection is that airplanes may be used for dropping gas bombs on the fire. The idea is perfectly reasonable if a gas can be found which will prove an effective fire-extinguisher in the open air. There is a vast difference between using a gas extinguisher in a building and in the open air. Outside, the diffusion of the gas is so rapid that it is comparatively ineffective. Here is a job for a chemist. If he can produce a gas bomb that will extinguish fires in the open air, there is no doubt that the airplane affords the quickest and best means of applying it to the fire.

The utility of aircraft in forest protection appears to be so obvious that it is no doubt a matter of surprise to airmen and to the public

Forest Fires at Last Conquered by Aerial Salt-Shakers ?

Salem, Ore.—A plan to sprinkle salt on the clouds to produce rain, which would curb the forest fire menace, was offered to Governor Olcott in a letter from J. J. Boyce, of Portland. Boyce would have the salting done from airplanes. The Governor did not declare himself in favor of the idea, but was reported to be considering the scheme to equip airplanes with

salt-shakers. Boyce, in his letter, called the Governor's attention to the fact that in flying one passes through zones where there is moisture in the air, but not enough to condense and form raindrops. Common salt would draw this moisture, if dropped from high above such an air current, Boyce maintained. He hazarded the opinion that clouds and rain would result.

that they are not to-day in universal use in Canadian for ests. Yet the fact is that they are not in universal use, and from present appearances, not likely to be in universal use for some years to come. Some patrol work carried on this summer by the St. Maurice Fire Protective Association (Quebec) represents practically all that has yet been done in Canada in the matter of forest air work. The main reason that aircraft are not in universal use is because no satisfactory answer has yet been given to the question, "Will it pay?" Or, to put it another way, "If a definite amount of money is to be spent on fire protection, will the best results be obtained by spending it on aircraft or on fire wardens?"

MEN OR MACHINES ?

Those responsible for fire protection are so far not at all convinced that best results will be obtained by spending it on aircraft. To illustrate: An estimate of cost prepared last spring for aerial patrol of a certain forest area in Quebec worked out approximately at \$23,000 (this did not include any provision for wireless.) This estimate was prepared without taking into account any expenditure in the purchase of machines, the intention being that machines should be borrowed from the Government. It did not take into account various other items, such as the construction of housing for the machines, depreciation, interest on the investment, workshop equipment, etc. Now, the figure of \$23,000 was intended to cover two four-hour patrols per day on an average of twenty days per month for a period of six months. With the same amount of expenditure on wages for fire wardens, a fire protective service would be able to employ for six months at \$100 per month practically forty wardens. Those concerned in fire protection work naturally ask the question: "With forty wardens, wouldn't we get better results than with the aircraft patrol?" Perhaps they would, and perhaps they

would not, but that is the question that, more than any other, serves to delay action in regard to the rapid application of aircraft to forest work.

Of course, in addition, there is the capital involved in the purchase of planes and other equipment; there also is the high cost of installation of wireless stations, because, to get full efficiency out of aircraft there should be wireless installations as well. To go into the business of applying aircraft and wireless to forest work involves a large capital expenditure and a large expenditure on operation.

While most people are convinced that efficiency would be promoted by an air service, the men responsible for expenditure on forestry work naturally weigh the pros and cons. They must figure on a dollar basis. They know pretty well what they can accomplish per dollar by a warden service. No one has yet given a practical demonstration as to what can be accomplished by aircraft on the dollar basis. Therefore, alluring as the prospect of a forestry air service is, it would appear that the development of such service will be comparatively gradual and comparatively slow.

PLANES ARE NOT FIRE-FIGHTERS.

There is another point in connection with this subject which also largely enters into the calculation of the forest workers: For the present the airplane is not of any value in actual fire-fighting. But an additional warden service (as in the case mentioned above, 40 wardens) would be of very distinct value in fire-fighting. Now, there probably will never be a time when no one is optimistic enough to expect that history will not from time to time repeat itself. With this in mind the forest worker will not discuss a forest air service without attaching great importance to what a large warden service can do against a fire, when an airplane would be powerless.

Popular belief in the utility of aircraft has developed from the wonderful accomplishments of the air-fleets during the war., But warfare is inevitably carried on regardless of cost. As soon as aircraft come to be applied to a commercial purpose they have to be dealt with on a commercial basis. In forest protection work a forest has a definite commercial value. Therefore there is a definite limit to what can properly be paid for protection work.

As intimated at the start of this article, most forestry people expect that eventually aircraft will be extensively used in forest work. It

seems certain the development will not take place with a rush. The value of forests is steadily rising. More and more attention is being given to their conservation. And more and more attention is being given to the utilization of new methods and appliances in that connection. It is not unreasonable to anticipate a complete revolution in forest fire systems and not unreasonable to expect that just as the fire warden is the main prop of forest fire protection to-day—discovering the fires and putting them out as well—the airplane will in the future do exactly the same work and do it more efficiently.

PROGRESSIVE LIMIT-HOLDERS READY TO PLANT

Those readers of the Forestry Journal on the lookout for signs of progress in the application of forestry principles to the timber lands of Canada will have a special interest in recent developments in Quebec Province. In a conference with the Minister of Lands and Forests, Hon. Horace Mercier, an able and progressive administrator, the Woodlands and Technical Sections of the Canadian Pulp and Paper Association, together with the Quebec Limit-holders' Association, discussed the whole question of the revision of regulations governing the cutting of timber on public-owned forest lands. It was argued, with great reason, that the present diameter limit method of regulation is based upon a desire of Canadian Governments in the early days to leave sufficient trees on cut-over lands to provide a timber stock for the ultimate farmer. Such a regulation was made in a day when many lumbermen were cutting on lands destined to prove of agricultural value. Very little of the present day timber cutting is on other than non-agricultural soils so that the diameter limit does not have its original justification. Furthermore, adherence to a blanket diameter limit irrespective of local conditions, has not worked out in the public interest in that it has failed to leave the cutting areas in a condition to produce a second crop of wood.

A PLAN TO REPLANT.

The meeting also discussed the conditions under which denuded Crown lands could be reforested by co-operation between the limit-holders and the Provincial Government. It was sug-

gested that legislation should be adopted encouraging licensees to plant forest trees upon areas of more than 10 acres deprived of coniferous timber. A special license would be issued in each case, planting to be undertaken within four years of issuance. Tree species would be limited to spruce and pine of all varieties. Four years after planting it is suggested the payment of one dollar per square mile shall vest the lessee with the absolute property of the land occupied under his license for 99 years and any after cost of the planting shall be refunded to the lessee by the Government. All land occupied or patented under the reforestation law should be free from all provincial, municipal and school taxes of any kind during the existence of the planting licenses. For any timber taken from the plantation by the lessee in the course of thinning for improvement purposes, the stumpage taxes would not exceed \$1.50 per cord. The lessee would have the right to clean cut the plantation after the trees had attained a diameter of six inches at 4½ feet from the ground, the stumpage tax payable to the Government not to exceed \$1.50 per cord.

Following the meeting with the Minister a committee was appointed to prepare definite recommendations to the Provincial Government. The members of this committee are W. Gerard Power, manager of the River Ouelle Pulp and Lumber Co., Robt. P. Kernan, of the Donnacona Paper Co., and Ellwood Wilson, Forester of the Laurentide Company.

PRAIRIE TREE PLANTING IS GOOD BUSINESS

Toronto Globe Editorial.

For three successive seasons, in certain parts of southern Saskatchewan and Alberta, conditions have been such that the farmers have failed to secure a crop. Many of the recent settlers in these areas have come almost to the end of their resources, and have neither the means nor the will to continue. Recent heavy rains which have broken the drought—unhappily too late to benefit the wheat crop—may enable owners of live stock to secure enough coarse grain and pasturage to carry their animals through the winter, but at the best the loss will be very serious, and, despite the prevalent and infectious optimism of the west, there will be a disposition to pull up stakes in those parts of the region afforded by the crop failure that are not assured moisture by irrigation.

While the failure this year has been due to lack of rain at the critical part of the crop season, much of last year's loss was the result of high winds which, after the grain had been put in under fair conditions, swept over the bald prairie, dried out the surface of the soil, and caused it to drift like the sand before a desert storm. In both cases belts of trees would have proved invaluable, for there is no doubt at all that forest growth not only conserves moisture, but that it has much to do in moderating the strength and direction of the winds. In a former geologic period the Canadian West was densely clad with forests, for the whole country is underlaid with coal that could have been the result only of forest growth. It was a country also of great swamps and watercourses, which provided sustenance and shelters for the saurian monsters, the remains of which are found in the Red Deer Valley and elsewhere, and that when restored and put on exhibition in natural history museums compel our wonder.

The puny efforts of man cannot renew the tropical humidity of the Alberta and Saskatchewan of that far-distant period, but forest growth should be done. Vast sums have been spent on opening up the country and providing it with railways and the facilities for growing and marketing grain. That great investment must clearly be followed up by forestry operations on a large scale.



CUTTING A NEW ROAD IN BRITISH COLUMBIA
Note how carefully the debris is piled for burning
in the centre.

Temporary expedients to set upon their feet settlers who have lost all through crop failures are all very well in their way, but they will in the end prove far more costly than a well-considered project extending over a long series of years providing for the planting and care of trees in the semi-arid regions. If this is not done there may be a reproduction on this continent of the tragedy of southwestern Asia, where the destruction of the forests has produced and perpetuated aridity over vast stretches of a region that was wonderfully fertile and provided with unfailing supplies of moisture. In Sheistan at this moment, "the wind of a hundred days" blows over arid and

sun-baked land that, when clothed with forest verdure, supported a swarming population, as the ruins of its cities prove.

Let us plant trees in the West for the benefit of the generations of Canadians there, and whose future prosperity is largely in our hands.

CANADA AND ITS NEIGHBOR'S WORRIES

The attitude of a large section of United States lumbermen as to the need of better forest management is expressed in a resolution unanimously adopted by the Western Forestry and Conservation Association. Unlike the Canadian Forestry Association, the "Western" body is a co-operative society of limit-holders dominating the wood-using industries of Washington, Oregon, Montana, Idaho and California. The resolution introduces the proposed programme of H. S. Graves, Chief Forester of the United States, "as the most constructive and statesman like treatment of the subject we have seen and we urge lumbermen and foresters alike to accept it as a basis for discussing future co-operation."

The application of Col. Graves' Forest Policy to the Pacific forest region was summarized by Mr. T. T. Munger as follows:

1. A public classification of all existing cut-over lands and of other lands as fast as they are cut-over in order to segregate those suitable for agriculture or pasturage and those primarily most valuable for production of timber.
2. Financial assistance to private timber-owners in the cleaning up of fire hazards such as slashes and the protection of cut-over lands.
3. Provincial co-operation between public fire protection funds and the private owner who undertakes to practice forestry on his timberlands.
4. Stricter enforcement of fire preventive laws.
5. A radical modification of the present tax system so that the owner may not be obliged to pay heavy annual taxes while the immature forest is still unproductive.

Readers of the Forestry Journal will note that the problem facing United States foresters and lumbermen is not primarily the chief obstacle to the advancement of forestry in Canada. The discussion at present being carried on in the United States hinges upon ways and means by which the private owners of the nation's chief timber supply can be persuaded to

adopt some of the rudiments of constructive forest management. Canadians have cause to be thankful that the ownership of about ninety per cent of the Dominion's forested lands has been persistently retained by the state, thus establishing public authority in forest conservation over practically the whole of the country's timber assets.

IMPERIAL FORESTRY CONFERENCE.

An Imperial Forestry Conference has been called by the British Government through the Board of Forestry Commissioners, recently appointed, to be held in London, England, in July, 1920, at the same time as the British Empire Timber Exhibit. A letter received by the Canadian Forestry Association from Mr. A. G. Herbert, Secretary of the Interim Forest Authority, states that invitations will shortly be addressed to the chief officers of Provincial and Dominion Government Forest Services in Canada, and to individuals prominent in the forest conservation movement. A letter from Lord Lovat expresses much interest in the forthcoming conference and assures those Canadians attending the conference of a hearty welcome.

A QUESTION AND ANSWER PAGE.

The Forestry Journal commences next month a new department in which the questions of our readers will be gladly answered. Discussion of any interesting point is invited. The Journal will undertake to secure authoritative judgment on all queries submitted by readers or their friends.

Please avail yourself of this new department which should prove of lively interest to all.

TIMBER SCALERS IN PERMANENT EMPLOY

In the Forest Service of New Brunswick, all timber scalers are in the permanent employ of the Provincial Government. This is in contrast with the prevailing practice in Ontario. Says G. H. Prince, Provincial Forester at Fredericton:

"One of the main duties of the forest service is to secure a correct return of the logs cut from Crown lands, and when it is stated that usually there are 700 or 800 camps and the cut exceeds 200 millions and 500,000 ties, it is seen that it is considerable of a task.

Each ranger is furnished with complete plans of the Crown land in the district assigned to him, and he is held responsible for the proper count, scale and return of all material cut from these lands each year. He is furnished with an assistant or counter, who assists him during the

scaling season. About 5,000,000 feet is considered sufficient work for any scaler. Each camp is visited every two weeks and the yards of logs counted and scaled, marked and numbered. A report is furnished the Crown Land Office every two weeks on the logs scaled and counted at each of the 700 or 800 camps in operation. This report is checked and a duplicate mailed at once to the licensees, so that he is properly informed of any infractions of cutting regulations, such as cutting undersized timber, too high stumps. If the licensee disputes the scale the logs are still there and a check scaler is put on and the dispute immediately settled. This system, tried out last season, has given very satisfactory results, and will be in use again this year, with only slight modifications.

"EDUCATIONAL" PATROL TO MATCH FIRE FIEND

By E. T. Allen, Forest Economist, Western Forestry and Conservation Association, Portland, Oregon.

At every one of our annual meetings for ten years we have boasted of the effectiveness of our western forest fire protective work. We calculate the percentage relation of our losses to the total timber supply guarded and it looks pretty good. Our methods and organization have improved every year. If they hadn't, forest fires would have about cleaned out this western country by this time.

GROWTH OF POPULATION HAS INCREASED HAZARD.

People don't realize this. They don't understand that the growth of population and industry throughout the forests has so multiplied the fire hazard, while labor, cost, and other difficulties have so hampered our defense, that it is really a great achievement to have held our own so well. The truth is that a tremendous forest area with a dry summer climate is being developed; consequently filled with fire-spreading activities of every kind, until it is becoming the world's greatest fire trap.

TEACHING THE PUBLIC ITS INTEREST IN FOREST PROTECTION.

We began ten years ago a campaign fairly well divided between doing our own part and teaching the public its interest in helping. By

various educational devices we did a great deal to improve public sentiment. Better fire laws were passed, better appropriation obtained, and more care with fire was observed. We have perfected organization, equipment and methods of detecting and fighting fire until we do more, no doubt, with the money and men we have than any one else does anywhere.

NOT ON TOP OF THE FIRE PROBLEM.

We have been, but it is getting too strong for us again, so we must go to the public. In other words there must be a fire rally.

SOUND THE ALARM!

Not enough money is being spent to safeguard life and property. There must be better state and federal appropriations.

FIRE LAWS MUST BE MADE TO MEAN AS MUCH AS

LAWS AGAINST OTHER CRIMES.

There must be officers to enforce the forest laws and indifference must not shelter the guilty. This whole subject must be brought before the people, legislatures and Congress, so it gets the attention it must, if this country is not to go up in smoke some day.

THERE MUST BE MORE CARE WITH FIRE AND
GREATER EXPENDITURE OF PUBLIC FUNDS.

Private, state and federal forces in our own territory should be put behind a western programme, dealing systematically with Weeks Law and other Congressional needs; with state legislation; with law enforcement, and with the part which should be played by the lumber industry and the public.

FOREST PROTECTION NOT A WESTERN PROBLEM
ONLY.

Interest in fire prevention and reforestation is showing signs of awakening everywhere. Never before has there been such a discussion of an American Forestry Policy. We should co-operate with all agencies to keep this agitation alive and before the public; emphasizing always that fire prevention comes first.

FOREST FIRES COST PUBLIC MILLIONS.

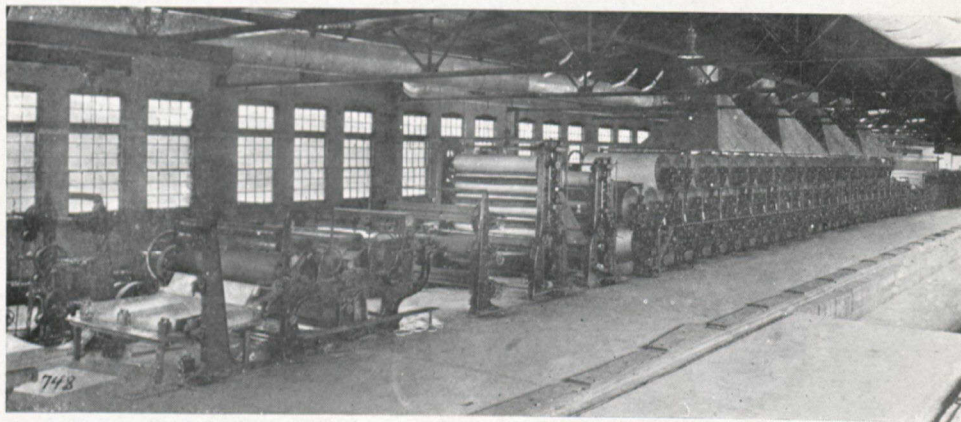
Forest fires are costing the west five or six million dollars every bad year. It is absurd to think all this fire is necessary. Much is preventable. I would almost guarantee for one per cent of five million dollars, I could make such a noise on the subject that we would practically reduce fire to lightning and incendiaries; jail most of the latter, and get enough federal and state money to eat up the fires that occur in spite of all. We cannot raise this one per cent ourselves, but I believe we can afford to do enough to make others join us.

PUBLIC HELP NECESSARY.

In short, just as we originally led the field in protection publicity, and as we now lead it in protection methods, let us realize that we are again where public help and money is necessary, and let us lead the field in going after this help.

THE STORY OF PAPER

By Job Taylor.



A modern paper making machine.

Backward as we are accustomed to consider the Chinese race, the art of making paper from fibrous material is known to have existed in China away back 200 years B.C. This became available to the western world in the eighth century A.D. over a thousand years ago. At Samarkand, a city between the province of Bokhara and Turkestan in Asia, a battle took place between the Arabs and the Chinese. This place was dominated by the Arabs and the Chinese made the attack in 751 A.D. The Arabs nursed them and took a

number of prisoners who taught their new masters the art of making paper from vegetable fibres. At this time the crescent had cast its shadow over the best of Europe. One boom tipped the straits of Gibraltar, from there it swung over the northern shores of Africa and dipped again at Constantinople. So the Arabs governing most of the western world introduced rapidly this Chinese art of making paper. The oldest recorded European document on paper is the deed of King Roger of Sicily in the year 1102. The Arabs made their paper largely out

of flax and some cotton, in Persia, and later in Europe out of rags.

That which revolutionized the manufacture of paper cheapened it, and put it within the reach of every one, was the invention of a machine for grinding wood to reduce it to pulp fibres. This was patented in Germany by Voelter in 1844, and later in the United States in 1858.

When paper made largely from wood fibre was introduced, the publishers would not use it. Pearson C. Cheney, who was governor of New Hampshire from 1875 to 1877, testified before the Senate Committee of Education and Labor about fifty years ago that when the pulp mill was built at Franklin, the paper manufacturers predicted ruin to the owner. As a last resort when no publisher would use it, this wood paper was substituted by the manufacture on a Boston paper order unknown to them. When the Boston paper sent in another order, the old regular paper was sent and immediately the publisher complained and requested the wood paper, though at that time knowing it was wood. This paper was used six months before they knew its constituents. Since the publishers found that wood papers worked better in the presses, from then on it had established itself.

In addition to the grinding of wood, there is another very important and essential process which helped to bring paper within the reach of all. Its principle was discovered by accident. One day a tramp papermaker was crossing the country. The sun was high in the heavens and the day was torrid. The heat became intense and so he sat down to rest in the first shady grove he reached. While he was cooling off he noticed a hornet's nest in the tree above, presently a piece of the nest fell down. He picked it up and found it to be composed of very tough fine fibres. His curiosity was aroused and he watched the hornet go to an old fence rail. He then went to investigate. He soon found the hornet was getting the strong fibre from the old rail. His papermaking instinct brought him to the thought that it would be possible to reduce the new green fibre in trees by chemicals in a short time as nature had done by years of oxidation. This, then, gave the world the chemical pulps.

PRESERVING ROOF TIMBERS.

Roof timbers in buildings where high humidity is the rule have been a source of trouble

to operators of paper and cotton mills, and other industries, because of their tendency to decay rapidly. In order to determine the best means for preserving such timbers, the Forest Products Laboratory at Madison, Wis., has conducted a series of tests of the various treatments. As a result, it was recently announced that the pressure method, with either creosote or a zinc-chloride solution, will give better results than steeping, dipping, or painting. Twenty years may be added to the life of the wood by this treatment, it is declared, though it is admitted to be the most expensive. Each cubic foot of timber should receive 8 to 12 pounds of creosote, or half-pound of zinc chloride, if the latter is used.

WOODEN SHIP 46 YEARS ON DUTY.

In view of the discussions that have taken place during the last year or two with regard to the seaworthiness and durability of wooden ships it is interesting to note the case of the famous old revenue cutter *Bear*, belonging to the United States coast and Geodetic service, which recently completed its thirty-third annual cruise to the Arctic. This vessel was built on the Clyde, Scotland, in 1874, as a steam whaler, but was soon acquired by the United States Navy Department, and first came into public notice through being used by Commander (later Rear Admiral) W. S. Schley on the Greeley relief expedition in 1884, as a steam the name of the old vessel has frequently appeared in print in connection with its various voyages to the Arctic and other strenuous service. It seems almost unnecessary to argue the durability and seaworthiness of properly built wooden vessels in view of the proud record of clipper ships before the days of steel construction and steam navigation.

They made stout wood ships forty-five years ago and they still make stout wood ships. When someone pipes in with a slur upon wood ships and their alleged unseaworthiness it might be well to mention the old *Bear*, now in its 46th year and not out of the hale and hearty class, despite her years of bucking Arctic ice and gales.

THE FOREST FIRE WARDEN

From the Christian Science Monitor.

Like the keeper of the light in a lonely tower anchored to the rocks possibly fifty miles off the coast, the warden of the forest, particularly in the mountaineous sections of the northeastern part of the United States, keeps his lonely yet interesting vigil. As the keeper of the light is versed in the lore and traditions of the sea, so the sentinel in the forest tower reads and interprets the language of the woods and forests. He knows the mountain paths and byways, can tell, at a glance, the geographical position of every hill in the distance, and can point out and name the score or more of villages hidden in the valleys behind sheltering trees or intervening ridges. In his months or years as a ranger or travelling supervisor, he has learned the topography of the region over which he watches, and is able to read it as he would read an open book. But he has other aids, of course, and is not compelled to depend entirely upon his memory. In the centre of his observation tower will be found a circular map, showing in detail the topography of every acre of woods and forest land within his district.

The extent of this district varies, of course, the area depending upon the range of vision possible from the tower, which is naturally placed upon the highest point available. Practice in observing and "locating," supplemented by the right kind of knowledge, makes it possible for the towerman to indicate, by reference to his map, approximately the exact point at which smoke or fire appears. Previous information furnished by the local fire warden may have assured the sentinel that the smoke may come from a brush fire made by a farmer or woodsman in clearing land, or from the campfire of a tourist or hunter. Lacking these assurances, the towerman acts promptly and effectively. With his telephone in the lookout tower, he calls, in a moment, the deputy nearest the point under observation, with the result that the fire is stopped before any considerable damage results. These details, furnished by the local warden, are recorded, along with such other facts as are regarded important, in the towerman's logbook, to be in turn submitted to state and federal authorities.

A casual visit to the quiet observation tower of a warden in the great wooded sections of the New England states, for instance, perhaps on a

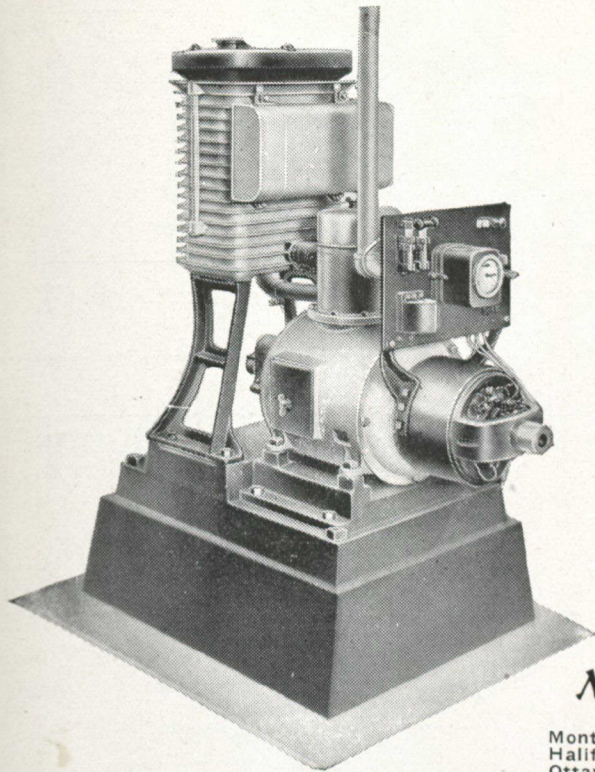
day when the clouds are low and the thin mists from the coast are idly drifting inland, may convince an uninquisitive sightseer that his quest has been vain, if he has come in search of the unusual and exciting. But if the visitor has known the lighthousekeeper, the prototype, in many ways, of the quiet man who sits in the warden's tower, or if he has himself, at some time, lived and dreamed dreams in solitary places, he will not find it difficult to persuade his host to talk. It has been said, and no doubt truly, that those who talk little quite often say much. Perhaps they say much because they talk only of the things about which they know much. So, at any rate, it seems to those who listen to the quiet story which the towerman tells of his work and his experiences, of the co-ordinate efforts among states and federal departments for greater efficiency in the important undertaking in which he and others are engaged. He seems, almost unconsciously, to speak the language of the forests and mountains, not in dialect or colloquialisms, but in the language of the man of books and of the vast open places, where expression is free and men are unafraid. The story has ended in the hour which has quickly passed. Within that hour there has apparently been wrought a strange but unmistakable transformation. Where sat the towerman, one, perhaps, of a legion of his fellows, sits a sage, a scholar, a teacher.

A BREAK-PROOF 'PHONE LINE.

The construction of the forest protection telephone lines in New Brunswick is proceeding satisfactorily. About 22 miles have been built, leaving 18 more to construct in order to reach the Bald Mountain Lookout Station. Since the arrival of snow the transportation of wire and provisions has been rendered much easier. The construction party consists of seven men and necessary teams. Mr. H. C. Kinghorn is in charge. The line is being built in the most modern method of tree construction. Tie wires are stretched across the road between opposite trees; the main telephone wire is attached to the tie wires by split insulators in such a position that it remains suspended over the centre of the portage and about 15 to 18 feet from the ground, very similar to the method in which

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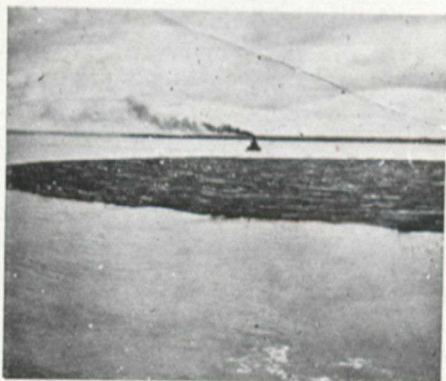
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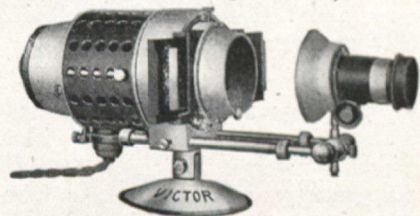
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FACTS FOR THE WEST TO DEAL WITH

(From the Manitoba Free Press)

That one path of future prosperity in Manitoba lies in developing the enormous possibilities in timber and pulp wood growing was explained to a special meeting of the Winnipeg bankers' and mortgage companies' managers yesterday afternoon by Robson Black, Secretary of the Canadian Forestry Association. Mr. Black addressed a meeting at Young Church Sunday night, and spoke again at Grace Church last evening, with motion picture illustrations. A total of ten meetings have been held in Winnipeg.

Forestry, said Mr. Black, is the science of obtaining maximum profits from a great natural resource. It is concerned with growing repeated crops of timber on non-agricultural soils; 75 per cent of Manitoba is under tree growth and not more than 35 per cent of the whole provincial area will ever pay a profit to the farmers' plow. One-third of Saskatchewan and Alberta are adapted by nature for the growing of profitable crops of timber. The timber and pulp wood of Manitoba, therefore, is the largest crop in point of acreage, and in view of the experience of such provinces as Quebec and New Brunswick and nations like Sweden, it offers incredibly great potentialities.

"Since Confederation the forest areas of Canada have been responsible for over 1,500 million dollars of export trade as compared with 2,000 million dollars received for cereal crops. This year pulp and paper exports alone from the spruce growing sections of Quebec, Ontario and to a smaller extent from British Columbia have jumped to 120 millions, as against 120 dollars in 1890—a million times as great."

THE PROFIT IN CONSERVING.

Mr. Black told how spruce areas in United States and Canada were making enormous rises in value. Forty million newspapers a day are produced on this continent and this publishing industry alone makes prodigious demands upon the very limited sources of spruce wood supply. Several American newspapers stripped from 15 to 30 acres of forest for each Sunday edition turned out. The Winnipeg daily papers were consuming probably 250 spruce and balsam trees with each day's run. Coupled with the

lumbering industry the pulp and paper industry had shown the old time phrase of "exhaustless forests" to be nothing short of undiluted moonshine. These industries in the eastern States and Canada were now coming forward with schemes which approximated scientific forest management. The day of forest butchery must end or the country ceases to be an international competitor. The history of the lumbering industry has been one of a continuous chase of virgin timber supplies from county to county, east to west, and north to south. President Dodge, of the International Paper Company, recently declared that there were not to-day two stands of spruce in eastern America that would justify the erection of two fifty-ton pulp mills. In eastern United States the last stand of the great American lumber industry was now being made in the south after stripping Maine, Wisconsin, Michigan and other lake states. The president of the Southern Pine Manufacturers has declared that 3,000 mills under his jurisdiction will go out of business in ten years because of exhausted forests.

LOSING FORESTS RAPIDLY.

Turning to Canada, the speaker showed that the forest resources in the three prairie provinces except for the areas in the forest reserves, are in a state of progressive deterioration. Eighty per cent of the west's original inheritance of splendid forests has been destroyed by forest fires in recent times. Mr. Black declared that few, if any, lumbermen and pulp company executives in eastern America were any longer deluded by the old fiction that unregulated logging at present in vogue throughout the Dominion will do anything but destroy the capital values of a timber area. Hence European practice now centuries old which looked upon a timber tract as a source of permanent timber crops was now being adapted to American and Canadian conditions. As far as the three western provinces are concerned this calls emphatically for the handling of the public-owned timber berths by the Dominion Forestry Branch, which is the Government's only technically qualified department.

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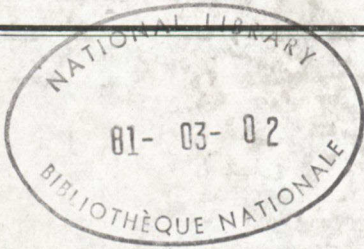
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