Vol. XIX
No. 7.

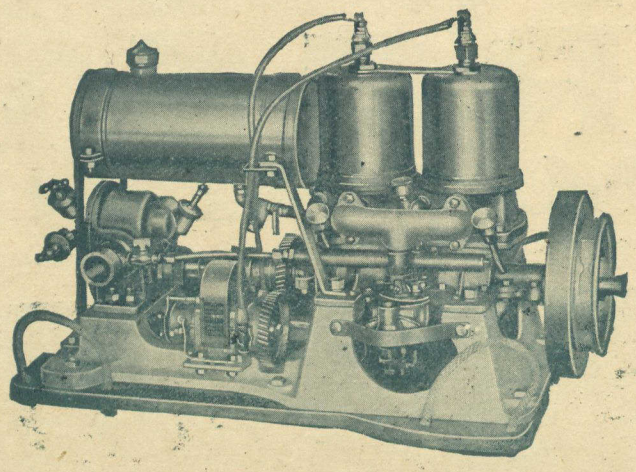
OTTAWA, CANADA, JULY, 1923

20 cts. per Copy
$2.00 per year.

The Illustrated CANADIAN FORESTRY MAGAZINE

Forest Problems of the British Empire, including programme of the coming Imperial Conference

"The Canadian Guide" by John Murray Gibbon



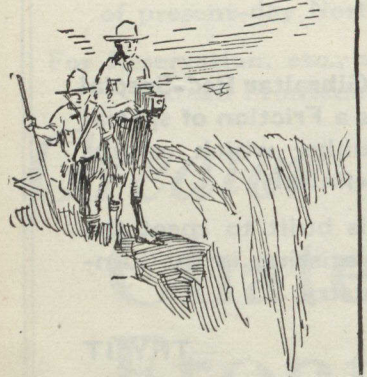
The New Fairbanks-Morse Forest Fire Pump

delivers a greater volume of water---during recent tests it delivered 55 U.S.G.P.M. It has drop forged connecting rods and crank shaft, a smaller fly-wheel which lowers the centre of gravity and eliminates the tendency to tilt when being transported. It has a rope starter, rigidly installed fuel tank. etc., etc.

It is believed that this new model is the most efficient and satisfactory fire pump that has yet been placed on the market.

THE CANADIAN FAIRBANKS-MORSE CO., LIMITED

St. John, Quebec, Montreal, Ottawa, Toronto, Windsor,
Winnipeg, Regina, Calgary, Vancouver, Victoria.



Eleven New Bungalow Camps in Canada's Forests and Mountains

Eight Camps in the Rockies

THERE are eight new Bungalow Camps in the Canadian Pacific Rockies; at Moraine Lake, Lake Wapta, Lake O'Hara, Yoho Valley, Emerald Lake, Vermilion River and Sinclair Hot Springs, the last two on the new Banff-Windermere automobile highway, and Lake Windermere, where you will find a good golf course in full view of mountain ranges.

All are situated in the midst of glorious scenery. Each camp is grouped around a central club house where you can dine, the meals are fine, or enjoy social diversions. They are within convenient riding or hiking distance of one another and all are easy to reach via the Canadian Pacific. Get close to Nature this year.

Rates, $5.50 per day, or $5.00 per day for a week or longer. American plan.

Three Camps in Ontario

THREE highly delightful outdoor districts of Ontario, offering excellent fishing and other recreational advantages, will be rendered more attractive this summer to holiday-makers by the erection of a comfortable Bungalow Camp at each place. Devil's Gap Camp, on the Lake of the Woods, near Kenora. Nipigon River. French River Camp, in the fascinating French River district.

These camps are of rustic frame type, with cosy bungalows (double and single). Central club-house with dining room, etc. Magnificent fishing—trout at Nipigon, bass and 'lunge at French River, bass and 'lunge at Lake of the Woods. Plenty of guides and canoes available.

Rates, $5.00 per day, $30 per week. American plan. Camps are especially attractive to families. Open July 1st.

All Easy to Reach and Easy on the Pocket Book.
Ask any Canadian Pacific Agent.

CANADIAN PACIFIC

IT SPANS THE WORLD

The Illustrated CANADIAN FORESTRY MAGAZINE

A Monthly Publication, National in Scope and Circulation, Devoted to the Conservation and Development of Canada's Forest Resources

VOL XIX — OTTAWA, CANADA, JULY, 1923 — No. 7

Published and Owned by The Canadian Forestry Association

Editorial and Business Offices

STANDARD BANK BUILDING, 51 SPARKS STREET, OTTAWA, CANADA.

Official Organ of The Ontario Sportsmen's Game and Fish Protective Association

Entered as second class matter in Post Office Department, Canada.

TABLE OF CONTENTS

INDEX TO ADVERTISERS

(Alphabetically arranged)

What Did You Do with That Match?

The suffering and loss caused by forest fires are common knowledge and, yet, carelessness with fire in the forest continues. These forest fires are practically all preventable.

Save Ontario's Forests

They're Yours

Every individual who steps inside the woods should remember he is in the midst of highly inflammable property, for the upper layer of ground in the forest consists of partially rotted wood, which will burn. Lack of consideration for this gave rise to the strenuous situation in Ontario the last week of May and the anxiety for days in some settlements.

Thoughtlessness or bad judgment or carelessness cause practically all forest fires. Your co-operation, as a citizen, is needed to prevent these fires by taking the same care in the woods as in your own home.

Ontario Forestry Branch

PARLIAMENT BUILDINGS,
TORONTO, ONT.

The Forest Problems of the British Empire

Great Gathering of Distinguished Forestry Leaders to be held in Canada—Vital Questions of Empire Welfare

IN the forefront of prominent men in attendance at the Empire Forestry Conference, to be held in Canada this year will be Major General Lord Lovat, K.T., K.C.M.G., D.S.O. Lord Lovat is Chairman of the British Forestry Commission, which is carrying out a gigantic program of reforestation in the British Isles. The English and Scotch forests were subjected to serious depletion to supply war demands, and the work of the Commission is to restore, as rapidly as possible, the forested areas in the United Kingdom. Indeed, the plans indicate that Britain has at last awakened to the necessity that she must provide for the production of a greater amount of home-grown timber.

During the war Lord Lovat was in charge of all the British forestry operations, and associated with him were many men, including Canadians, prominent in the lumbering and pulp manufacturing world. He has many friends in Canada, and it is anticipated that his coming will warm the hearts of many a member of clan Fraser, of which Lord Lovat, as Simon Fraser, is Chieftain. Not only is he a man of great energy, broad vision and outstanding ability, but he is possessed of a most charming personality. The several Canadians who were delegates to the Empire Forestry Conference held in London in 1920, speak very highly of his ability as the leader of that Conference.

Other United Kingdom delegates will be Sir James Calder; R. L. Robinson, O.B.E., Technical Forestry Commissioner; Professor R. S. Troup, Head of the Forestry School at Oxford University; Dr. A. W. Borthwick, Research Officer; Fraser Story, Head of the Intelligence Service; and, Dr. J. W. Munro, Forest Entomologist, of continental repute.

Other Notable Visitors

In addition to these official representatives of the Imperial Government, it is fully anticipated that the Conference will be attended by Lord Clinton, one of the Forestry Commissioners; Lord Chichester, of the English Forestry Society; Right Honourable F. D. Acland, Forestry Commissioner; J. S. Corbett, Secretary of the British Empire Forestry Association, and others.

The Colonial Office will be represented by Major R. D. Furse, D.S.O.; Ceylon, by R. M. White, Deputy Conservator of Forests; Nigeria, by J. R. Ainslie, Senior Conservator of Forests; Kenya, by E. Battiscombe, Conservator of Forests; Strait Settlements and Federated Malay States, by G. E. S. Cubitt, Conservator of Forests; and British Guiana, by S. Hohenkerk, Forestry Officer.

The various Dominions will also be adequately represented: the Chief Forester from South Africa assisted by a Member of the Chamber of Commerce; India will have representation from the Forest Service proper, and also from her Research Institute at Dehra Dun; Australia by Owen Jones, B.A., Head of the Forestry Commission; and finally, New Zealand by Captain L. McIntosh Ellis, Director of Forestry. In the last mentioned Canadians will be particularly interested as Captain Ellis is not only a Canadian by birth and upbringing, but also was educated at the Forestry School, Toronto University, and for many years was identified with forestry work in Canada.

Conference Aims

It is the aim of the Conference to find ways and means of making the Empire self-sustaining in its timber supply. This involves careful stock taking of forest resources, the pooling of information in regard thereto, and the establishment of facilities for increasing Empire trade generally in forest products. In many cases possibilities have been neglected purely through ignorance that has prevailed regarding supplies and facilities.

A most important feature of the Conference is to place plainly before the people the actual condition of Empire forestry affairs. In some parts of the Empire forest management is on the basis of sustained yield, while in others cutting is carried on greatly in excess of annual growth, so that the woods capital

Empire Facts

The British Empire has 700,000 square miles of "effective forests," the remaining area being unprofitable or inaccessible.

Canada has about 50% of the total, India 14%, Nigeria and the Gold Coast 14%, Australia and New Zealand about 8%.

The United Kingdom, the great wood-consuming center of the Empire, has less than one-third of one per cent under forests.

Seventy-five per cent of the forest area of the Empire still belongs to the State and only 25% to corporate bodies and private individuals.

Only 2½% of the forest area of the United Kingdom is State owned.

The Empire's imports of wood and timber just before the war exceeded exports by 150 million cubic feet per annum.

The United Kingdom drew (1909-1913) 88%, by volume, and 83%, by value, of her imports from without the Empire.

is being seriously impaired. These and many other related subjects will receive attention at the Conference.

The Conference will be officially opened in Ottawa on July 25th, and immediately thereafter the Eastern Tour to the provinces of Quebec, New Brunswick, and Nova Scotia, will be undertaken. This will be followed by business sessions to be held in Ottawa during the week of the 6th to 11th. Following upon the business meetings the Conference will start on the Western tour, visiting points in Ontario, Manitoba, Saskatchewan, Alberta, and the interior of British Columbia. Subsequently a tour to appropriate points on the mainland in Vancouver Island will be taken by boat; the Conference finally reaching Victoria where the concluding sessions will take place.

Discuss Softwood Supplies

The predominating theme for discussion at the British Empire Forestry Conference, will be "World's Softwood Supplies". Although hardwoods are essential for many purposes, the advantages of the softwoods for all forms of ordinary construction, and especially for the manufacture of paper, the demand for which is constantly and greatly increasing, render them of paramount importance in the economic life of the civilized world.

The Conference will be attended by authorities who have been making special investigations regarding softwood supplies. Although the Conference is essentially of an Empire character, and it is desired above all to assist in rendering the Empire self-sustaining in its timber supplies, it is also necessary to take cognizance of similar supplies available in other countries. It is expected that by the conclusion of the Conference, a thorough preliminary inventory of the softwood resources throughout the world will have been completed.

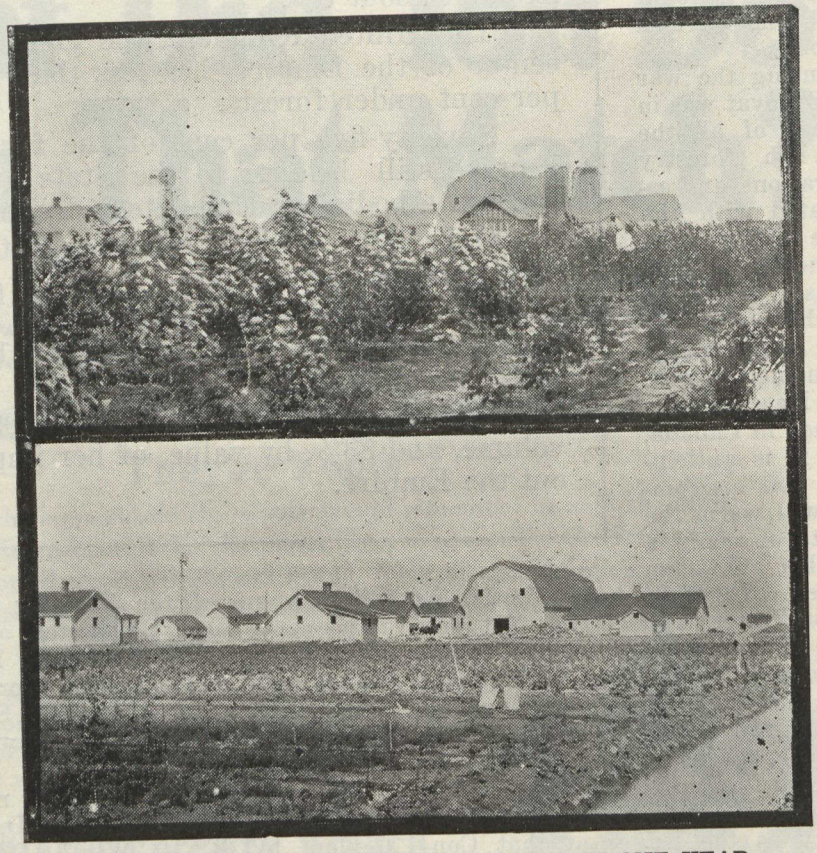
Canada and the Conifers

It is most appropriate that such a subject should have been chosen for the main discussion in Canada, for our country has been most aptly described as the "Softwood Storehouse of the Empire". By reason of our more northerly location, we enjoy peculiar advantages for the growth of coniferous timber. Although extensive hardwood forests are found in eastern Canada, particularly as regards maple, birch and beech, which are present in considerable quantities, it is nevertheless a fact that the economic trees for production and exploitation in Canada are the pines, spruces, firs, cedars, hemlocks, etc., —all softwood trees.

It must be remembered that, as an essential process in placing lumber on the markets, it is customary in eastern Canada (where the extensive hardwood forests occur) to utilize the old method of "river driving" to convey logs from the woods to the sawmills. So far, it is, to all practical purposes, commercially impossible to transport hardwood logs for long distances in this manner, and it is this feature which, in a measure, renders a great portion of our hardwood forests as of problematical value. This particular feature of the situation offers a very interesting field of research, namely, to see whether some means can be provided to render hardwood logs drivable, or else in some manner to devise means whereby they may be taken from the woods to the mills by other methods.

Canadians may feel especially proud of the fact that Canada has been selected as the meeting place of the second Conference. No effort is being spared to justify this decision, and it may definitely be anticipated that the numerous delegates will return to their respective countries with a very much clearer conception of Canadian conditions, the advantages of Canada as a source of raw forest products, and also of her remarkable development in the manufacture of wood into a great many products.

ONE YEAR'S GROWTH MADE THE DIFFERENCE



TREES MAKE WONDERFUL GROWTH IN ONE YEAR.

Upper picture: Clarindale Stock Farm, Vauxhall District, Alberta, July, 1922. Lower picture: Taken in same spot, June, 1921. (Note great improvement in appearance due to one year's growth of trees).

Photo by courtesy Canada Land and Immigration Co.

Our Canadian Guide

A Resumé of the Virile Part He has Played in the Development of Our Nation.

By John Murray Gibbon *

A HUNDRED miles or so north of the city of Quebec, Joe was paddling our canoe back to camp along the shore of Lake Edward from an inlet sacred to trout. His stroke was leisurely but always rhythmical, and after a while he began to hum. It might have been a Stabat Mater but, when eventually the words did come, they were the words of a folk-song. Verse followed verse, sung in a soft deep voice of rich and resonant timbre. I caught a phrase or two sufficient to remember, and that night in camp elicited the rest. Four verses give the character:

Petit rocher de la haute mon-
[tagne,
Je viens ici finir cette campagne:
Ah! doux échos, entendez mes sou-
[pirs;
En languissant je vais bientôt mou-
[rir!

Petits oiseaux, vos harmonies,
Quand vous chantez, me rattachent
[à la vie,
Ah! si j'avais des ailes comme vous,
Je s'rais heureux avant qu'il fut
[deux jours!

Seul en ces bois, que j'ai eu de soucis!
Pensant toujours à mes si chers amis,
Je demandais: 'Hélas! sont-ils
[noyés?
Les Iroquois les auraient-ils tués?'

C'est donc ici que le mond' m'aban-
[donne!
Mais j'ai secours en vous, Sauveur
[des hommes!
Très Sainte Vierge, ah! m'aban-
[donnez pas,
Permettez-moi d'mourir entre vos
[bras.

LITERARY CANADIANS "SNAPPED" ON WESTERN TOUR

John Murray Gibbon, popular Canadian author receiving a "pointer" from Bliss Carman, Canadian poet and, apparently, enjoying the experience

The song was known to Joe as *La Plainte de Cadieux,* and when I had finished transcribing he told me its history. It is the oldest poem recorded as having been written in Canada.

Two hundred years ago, before the English had captured Quebec, Cadieux was an interpreter, guide, voyageur, who accompanied fur trading expeditions up the Ottawa river under the licences or *congés* issued by the French king. He had spent the winter hunting, trapping and trading, and with his party was encamped on Calumet Island, at the portage above the rapids. Word came from a friendly Indian that the Iroquois were on the war-path and were lying in ambush. No one hitherto had run these rapids, but if someone could distract the enemy's attention while the attempt was made, here was a forlorn hope. Cadieux, with a young Algonquin, undertook the diversion, firing shots in rapid succession, while the rest of the party dared the perilous descent. This they made in safety, but Cadieux never rejoined them. After the Iroquois had gone they found his body in a shallow grave, hands over his breast, covered with branches, a cross erected at his head. The guide had driven off the Iroquois, but had been mortally wounded, with strength enough left only to dig his own grave. Before he died he had inscribed on a strip of birch bark this death-song, which a hymn tune had made popular. Among the French-Canadian guides Cadieux is an epic figure, their Achilles or Odysseus, their legendary hero, and as they paddle along, nearly always to the rhythm of folk-song, this naturally comes to mind.

The story of Cadieux will help not a little to understand the character of the Canadian guide and his place in this northern half-continent. Half-continent is true, for half the area of Canada is lake and river, waterways through her vast forests. The colonists of New France sailed up the St. Lawrence and the Ottawa far into the interior, assimilated with some at least of the aboriginals, canoed and portaged up the Mattawa, over Lake Nipissing, down the French river into the Great Lakes, and were trading on the Mississippi and Missouri while the English colonists to the south were still clinging to their seaboard. The French of to-day seem rooted to their cities or their soil, whereas the Normans of Louis the Fourteenth still had something of the Northman Viking spirit. They were axemen and hunters ripe for the adventurous life offered by the Canadian backwoods.

So attractive was this life that the orderly regime designed by the 'Grand Monarque' for the colonization of New France and the traffic in furs was dissipated. The young men would not stay on their farms, marry the wives sent out to them, work as sub-

*Reproduced from an article in "The 19th Century and After" (England)

missive peasants under the organized companies and officers set over them. They foraged the woods for themselves, hunted, trapped, took one or half a dozen squaws, embraced the wild outlaw life of coureurs de bois, returning to the city only to spend their swag.

It was a curious scene (says Parkman) when a party of coureurs de bois returned from the rovings. Montreal was their harboring place, and they conducted themselves much like the crew of a man-of-war paid off after a long voyage. As long as their beaver-skins lasted, they set no bounds to their riot. Every house in the place, we are told, was turned into a drinking shop. The new-comers were bedizened with a strange mixture of French and Indian finery; while some of them, with instincts more thoroughly savage, stalked about the streets as naked as a Pottawattamie or a Sioux. The clamor of tongues was prodigious, and gambling and drinking filled the day and the night. When at last they were sober again, they sought absolution for their sins; nor could the priests venture to bear too hard on their unruly penitents, lest they should break wholly with the Church and dispense henceforth with her sacraments.

The Guide of today

I WAS reminded of this passage when I arrived one day in La Tuque after travelling ten days across country and saw some of our guides an hour or two after they had been paid off, bedizened in yellow boots and new store clothes, roaring round the main streets in various stages of whiskey blanc, until they had to be suppressed in the local gaol. Not all, however, and particularly not Joe, who had a wife and fifteen children at home, with an eye on a farm that needed only the little capital he could earn as a guide.

The part played by the French in the opening up of the West and North-West has been fairly acknowledged by British and American historians up to the end of the French dominion, but from that time on French names are only incidental in the histories of exploration. In their Carver, Samuel Hearne, D. W. Harmon, Sir Alexander Mackenzie, David Thompson, Simon Fraser, Lewis and Clarke, Sir John Franklin, Sir George Simpson, Milton and Cheadle. On the other hand, that excellent French-Canadian historian, the Rev. place we hear of such as Jonathan A. G. Morice, in his 'Dictionnaire historique des Canadiens de l'Ouest,' raises the question, Who did the hard work of these expeditions? Who were the humble companions of the intrepid explorers, by their devotion making success and glory possible? Was it not the guides and interpreters, without whom nothing could have been done? Is it not time to give these guides their fair acknowledgement?

On his first journey of exploration across the Rockies Sir Alexander Mackenzie, dozing in his canoe, missed noticing several large tributary rivers. One cannot, however, imagine the guides being asleep.

Among the guides mentioned by Morice, Jean Baptiste Boucher, a half-breed, commonly known by his Cree name Waccan, was one of nineteen voyageurs who ran the dangerous rapids of the Fraser river with Simon Fraser in 1818. Waccan exercized a remarkable influence over the Indians. David Thompson owed much to Charles Legace, who accompanied this geographer of the North-West Company as guide and interpreter on three separate expeditions. Alexis Bonami Lesperance, a man of enormous strength, was one of the principal guides for the Hudson's Bay Company a hundred years ago, and drove the brigade of bateaux in the fur trade 4,000 miles each summer season. Toussaint Charbonneau, a guide of the North-West Company, was of valued assistance to many explorers, including Lewis and Clarke, on account of his intimate knowledge of the Missouri valley. Sir John Franklin owed more than he was willing to admit to Pierre Saint-Germain, his half-breed guide on the tragic expedition of 1821, and was glad to use the map of the Coppermine river drawn for him by another guide, Francois Beaulieu. John Jacob Astor paid a tribute to the French Canadians when he said that one of them was equal to three Americans for river service. The expedition of the 'Tonquin' to Astoria was manned largely by French Canadians, who carried on the development of that district, although Americans got the credit.

The "Boxing Bears" at one time famous in the Canadian west.

Many of the guides of this period were noted for enormous strength. Joseph Paul, guide for the North-West Company, repaid a trick played on him by a trader who filled a sugar barrel secretly with lead bullets and dared the guide to lift it. Paul hoisted the barrel and let it fall on the counter, smashing the woodwork to pieces, and breaking the barrel so that the bullets spilled into the cellar.

Some giant loads

One is still amazed at the loads that a French-Canadian guide will carry over a rough portage. Joe, with a pack of 300 lbs., walked faster than I could walk with nothing but a fishing-rod. True, Joe was a gargantuan eater. Every day he consumed fifteen eggs, five to each meal, in addition to porridge for breakfast, bacon, fish, pork and beans, steak, flapjacks (pancakes) and fruit. Then he complained he could not eat because of indigestion.

The French Canadian plays a considerable part in the school of backwoods fiction inaugurated by Gilbert Parker and embellished by innumerable romancers who reconstruct Canada in New York. These latter have a tendency to make their half-breed French-Indian guide the villain of the story, although the half-breed French-Indian girl is just as often the heroine. They find in the picturesque patois poems of Dr. W. H. Drummond a ready-made vocabulary easy to appropriate. As a rule, however, the French-Canadian guide of today speaks no English, although he may understand a few words. His English may, indeed, consist of a string of oaths picked up from some foreman in the shanties. He is admirably depicted in the François Paradis of Louis Hémon's recently rediscovered classic 'Maria Chapdelaine.' I quote from the translation by W. H. Blake:—

"Assuredly a handsome fellow; comely of body, revealing so much of supple strength; comely of face in well-cut feature and fearless eyes — everything about him had an air of perfect simplicity.

BRINGING BACK THE TROPHY AT KIPAWA LAKE, QUEBEC

Mother Chapdelaine took up her questioning.

'And so you sold your farm when your father died, François?'

'Yes, I sold everything. I was never a very good hand at farming, you know. Working in the shanties, trapping, making a little money from time to time as a guide or in trade wih the Indians, that is the life for me, but to scratch away at the same fields from one year's end to another, and stay there for ever, I would not have been able to stick to that all my life. I would have felt like a cow tethered to a stake.'

'That is so, some men are made that way. Samuel, for example, and you, and many another. It seems as if the woods had some magic for you.' She shook her head and looked at him in wonderment. 'Frozen in winter, devoured by flies in summer; living in a tent on the snow, or in a log cabin full of chinks that the wind blows through, you like that better than spending your life on a good farm near shops and houses...'

François Paradis looked at the floor without making answer, perhaps a trifle ashamed of these wrong-headed tastes of his.

'A fine life for those who are fond of the land,' he said at last, 'but I should never have been content.' "

It was the everlasting conflict between the types; pioneer and farmer, the peasant from France who brought to new lands his ideals of ordered life and contented immobility and that other in whom the vast wilderness awakened distant atavistic instincts for wandering and adventure.

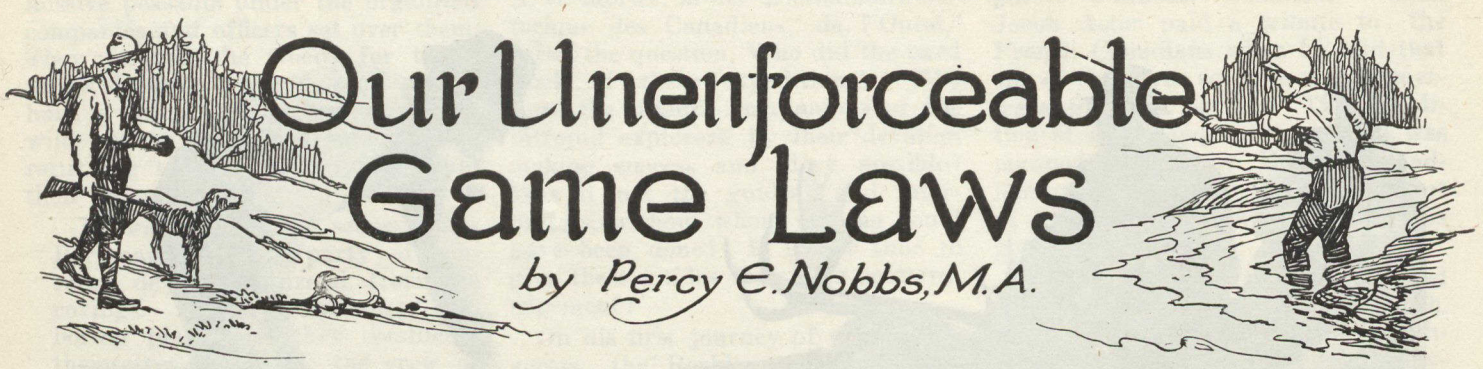
Quebec, however, is not the only province in Canada where there is good hunting and fishing, and the French Canadian is not the only available guide. Nova Scotia, New Brunswick, Ontario, Alberta, British Columbia, quite apart from the North-West Territories, have all produced their distinctive types with special skill in the kind of fishing or hunting peculiar to their territory.

In Quebec the guides are mostly French Canadian, half-breed or Indian. The characteristics of the French Canadian have been already dealt with. Quebec is the largest province in Canada, and, with the inclusion of Ungava, covers a territory of 700,000 square miles, or more than England, France, Germany and Spain combined. Considerable areas are allotted to private clubs which assist in the preservation of game, stock their lakes with fish, and build roads. The Laurentian Club, for instance, has opened up 175 miles of portages and constructed twenty-three miles of waggon road. It pays out over $30,000 a year to wardens, guides and other employees. There are 200 fish and game clubs in this province with territories not supposed to exceed 200 square miles each. Between lumbering, guiding and trapping, a guide can make a fair living, and this accounts perhaps for the apparently larger number of 'hunters and trappers' in the Canadian census returns for the province of Quebec as compared with the provinces of Nova Scotia and New Brunswick. According to the census of 1911, which gives the latest official figures available, the following declared themselves as hunters or trappers by profession:

	Male.	Female.
Nova Scotia	35	—
New Brunswick	32	—
Prince Edward Island	2	—
Quebec	871	14
Ontario	2151	77
Manitoba	53	2
Saskatchewan	1773	32
Alberta	866	3
British Columbia	580	8
Total	6363	136

Most of these, or at least the males, are also, without doubt, willing to act as guides. Incomplete as the figures evidently are, they indicate that the greatest variety and quantity of fur-bearing animals is in the northern territories of Quebec, Ontario ,the three so-called prairie provinces, and British Columbia.

Editor's Note—This is the first instalment of Mr. Gibbon's very timely appreciation of the Canadian Guides of the past and present. Further portions will be published in our subsequent issues.



Our Unenforceable Game Laws

by Percy E. Nobbs, M.A.

THE Game Laws of Canada present, in miniature, the characteristics of our legislation as a whole, so far as origins are concerned. Some derive from the feudal system of Europe, some from the early conditions of this country, and some from modern scientific research. In spirit and intention they are generally admirable; protection is intended for Wild Life during the breeding season, and in a lesser degree during the mating season, and there is restriction as to methods of capture, and sometimes as to marketing, with a view to maintaining and conserving each species. Considering the number of legislatures concerned, there is general uniformity of intention and fair coordination in the game laws of the various provinces, and so far so good. One might probably say as much for the laws 'regulating' prohibition. But the proof of a pudding is the eating of it, and in the case of game laws, practical tests are involved in answer to the questions:—Are our game laws generally observed? Do they achieve their purpose? To these, the reply of any sportsman with a general experience must be somewhat disconcerting. It is common knowledge that our game laws are far from being generally observed; if they were, they might achieve their purpose. It is a matter for wonder and congratulation, however, that, things being as they are, they achieve their purpose in spots, and such success as there is may be full of suggestion for future developments.

Difficulties of Enforcement

From the nature of things, Game Law is largely a matter of prohibitions—"Thou shalt not" is, however, not a very impressive argument with a high spirited people, when the question "Who's to prevent me?" remains unanswered. It would take a body at least as numerous, as conscientious, as zealous, as well trained, and as efficiently led as the Canadian Corps, in the heyday of its 1918 successes, to enforce the existing game laws of Canada, and the maintenance would be no less expensive per man in the field, though the cost in blood might be negligible.

Putting legislation on the statute book, that cannot be enforced, is a favourite pastime of the politician—the effect is always subversive. It brings the laws generally into contempt, and it creates a privileged body of law breakers.

Now, there are many zealous and competent officials in the game protection services, but there are also many very unsuitably endowed personages, and one weak, ignorant or unscrupulous official can do a tremendous amount of damage to the cause of game protection.

The first qualification for a game warden is skill as a hunter—knowledge of his subject, that is. He must therefore be recruited from the very class most intimately associated with game killing. It follows that he must be appointed away from his home district, and be moved on occasion. A lurid poaching past should be no drawback in appointment — an unadventurous spirit (manifest perhaps in a record of inane respectability) ought to damn the applicant's chances. Game protection is a professional hunter's job.

A bear in a trap—An evidence of questionable sportsmanship on the part of someone.

Now, how is your game warden to make himself effective over large areas inhabited by .002 persons per square mile where roads may be few or non-existent? If he is a woodsman, the fewer people in his area the better he will be able to read the every movement of those within it, but obviously he cannot be on a hundred lakes at a time. A good reputation for scouting may enable him to spiritually infest a thousand miles of trail, but let us be frank and admit that his task is impossible. He cannot prevent killing out of season and can, at the best, only bring home one case out of many of which he becomes cognizant. This helplessness saps his zeal. Now, if the game laws were less scientific and less traditional, but more human and practical, the game warden's efficacy would be immensely enhanced. It is futile to write into the statutes of a thinly populated province prohibitions against fishing for trout and for salmon, covering different periods of the year. The same tackle and the same water are involved, and who with an appetite and sporting blood in his veins, and the privacy of the woods, will deal gently with a law-breaking trout or salmon that insists on trying to be caught?

Seasons should Synchronize

Or again, in the case of big game, we have areas where moose, deer and caribou may occur. The open seasons for all three should synchronize. Then a man either has or has not the right to be prowling through the woods on a specific day of the year with a high-powered

rifle, and the game warden can ignore him or evince an interest in his intentions, accordingly.

The case of birds is not dissimilar, and an example occurs in the case of two migratory species infesting the same beaches at the same time of year,—the one protected a few weeks longer than the other. They mix to a certain extent, and it is impossible to gun for one without killing the other (Wilson snipe). One way is to take what comes. Another is to pluck the mistakes, and then eat them in secret, and yet another, practised by the inhabitants of the region, is to bury them before leaving the beach. But if a man with a gun has any business in these places at all, he is likely to stay out all night and bang away with heavier shot at the morning flight of black duck and pick off some woodcock, too, perhaps, and all while ostensibly shooting for plover and yellow legs.

The open seasons should be regulated so that the man with rod, gun or rifle can take all that comes his way. Over protection of one species and under-protection of another, may be the result *on paper,* but in fact it would immensely increase respect for the law and facilitate the work of the wardens. In a catastrophic climate such as ours, where from 50 to 90 per cent of any species may be wiped out by natural causes in any year, scientific niceties as to dates as affecting species are a mistake, in the present state of our moral culture, at least.

Zoning Is Feasible.

Zoning is quite another matter, however, and there is as yet far too little nicety regarding this in our game laws. The principle is established and will probably, as time goes on, find many applications. So far the game laws have failed to take sufficient account of the fact that our provinces are as extensive in area as many first-class European states and that besides physiographic diversities within themselves there is great variation from district to district in the matter of concentration of population and occupational character.

If the times at which one might be privileged to fish, to shoot, to hunt, were simplified so that, in any given locality, nearly all fishing or shooting or hunting began and stopped on specific generalized dates, that does not mean that the length of open season should not be made to vary, corresponding with the related factors of accessibility of areas, density of population, and diversity of wild life.

Just as under scientific and practical control the development of cities can be regulated by zoning laws to the end that all may have their share of air and sunshine in home, work place, street and park, so, by use of the zoning principle, the conservation of wild life could be regulated to afford a food supply and a recreation as long as the state lasts.

The promulgation of the game laws is all very well, but the promulgation of Nature's laws would do at least as much good if done in the right way. In the schools we have an agency for informing all citizens of their place in the scheme of things, as the wildest animals in our woods (to quote a recent contributor to these pages) and incidentally introducing to them in its pleasantest guise those principles of natural economy on which, after all, mere political economy is based. The life history of the salmon, the duck and the moose, are matters on which the public at large is extraordinarily ignorant, and might easily be both well informed and interested, to the great profit of mankind.

There is little hope of a better sense in these matters until public spirit and public conscience have been aroused beyond the point where legislators at Ottawa can regale their visiting constituents on 'birds' killed for the most part, shipped and sold, in defiance of the game laws. It is common knowledge, and it does not appear to constitute public scandal, that Quebec partridges are sold and served in vast numbers at the leading social clubs on each side of the river at Ottawa. With such examples set by our chosen representatives, is there any wonder that our game wardens are often slack and sometimes corrupt and that the people at large continue uninstructedly to squander their glorious heritage in the wild life of their country?

Up Goes Your Lumber Bill!

THE recent rapid increase in the cost of lumber is shown by the record of wholesale prices extending over various periods since 1840. The wholesale price of lumber from 1840 to 1860 was $10.50 a thousand feet. Between 1866 and 1900 it was $16. Between 1900 and 1914, $25 and in 1920, $75. Freights increased 100 per cent and wholesale prices 200 per cent. since 1915. This inflation is due to many reasons, chiefly to the exhaustion of supply which has resulted in long hauls and expensive operations in regions difficult of access.

Timber was first taken from localities nearest the markets. As that source was exhausted the transportation distances became longer and the timber regions were confined, in many cases, to a more rugged country so the cost of production has been forced higher and higher.

This is strikingly shown by the way lumber outstripped all other commodity prices in the purchasing power of the dollar. Before the Civil War the increase of lumber prices kept on an even basis with the average increase of other commodities, but after that lumber prices jumped.

The difference between lumber and other commodities for the period between 1870 to 1900 averaged about 70 percent. higher for lumber. After the Eastern pine had been exhausted, values of lumber over all commodities had increased 140 per cent. The dollar of 1915 purchased about as much of all commodities as it did in 1840 but it required $2.34 in 1915 to purchase as much lumber as did one dollar in 1840 and lumber that could be purchased in 1840 for $100 cost $510 in 1921 while according to the investigations of E. H. Clapp of the U.S. Forest Service, all-commodities which cost $100 in 1840 could be bought for about $143 in 1921.

The rapid increase in the cost of wood to consumers is bound to continue because nothing is being done to adequately relieve the situation, and it will be a long time after remedial measures are initiated before relief will be felt. No business activily can be carried on without being affected directly or indirectly by the price of wood. Lumber is therefore an important factor in the cost of living and as long as we are willing to remain inactive in reforesting on a large scale the longer and more severe will be the drain on the pocketbooks of the people.—The New York State College of Forestry, Syracuse University.

Useful Facts on Protecting the Woodlot

Keep Out Cattle and Fire and Operate the Woodland with a View to a Self-Perpetuating Source of Farm Supplies

By Arthur Herbert Richardson, M.A., M.F.

EVERY crop which is grown on the soil requires some care and protection from enemies such as disease, insects, fire and trespassing cattle. In this respect the woodlot or forest crop is no exception and the owner of woodland who desires to get the best from his trees will give them reasonable and intelligent protection.

Disease and Insects

The presence of wood rotting disease on the trees of the woodlot is indicated by hollow trunks, discoloured and rotting limbs and the presence of mushroom or bracket shaped bodies which appear on the surface of the tree. These are not the actual disease itself but the exterior fruiting bodies of the disease which is working inside the tree. In a great many cases such disease is commenced by injury either through fire, storm or cattle. There are also other diseases which seriously damage trees and give them an unhealthy appearance, sometimes marked by dying branches, distorted twigs, swollen areas on the bark and other indications.

Insects are also responsible for considerable damage, especially where the forest is composed pretty much of the same tree. Leaf-eating insects show their presence by destroying the foliage. When the insect is one that works under the bark and either bores into or girdles the tree, its presence is manifested by fine sawdust which accumulates below where the insect is working. Where the attack is serious the tree may show signs of failing by the abnormal colour of its foliage, or, in the case of a girdling insect, the bark may become loose over large areas.

Mature trees in the woodlot destroyed for several feet at the base by ground fires.

The foregoing, it will be understood, is just a fragmentary sketch of some of the injury incurred by trees by these two agencies. In most cases it is not advisable to attempt combative measures except on a few individual trees in the forest because of the expense. It would be wise, however, in the case of trees seriously attacked to remove them as soon as possible from the woodlot, before they go too far to be of use and lest the attack spread to other trees. Also, as disease and insect attack is likely to be worse in woods which have been damaged by fire, grazing, wind and careless scattering of brush, it is advisable to prevent such attacks in their incipient stage by eliminating in part the cause. If the presence of either fungus or insects becomes alarming, or if exact information regarding the attack is desired, it would be well to write for special treatment, sending full information and specimens, if possible, to the nearest Government Department.

A part of this woodlot has been protected from cattle and has produced a fine stand of seedlings. The other part has been grazed clean of all young growth.

Wind and Storm

Wind storms and lightning are responsible for some damage in the woodlot, such as broken tops or the throwing of entire trees. No precaution can be taken to offset the damage caused by lightning but damage by wind may be prevented to some extent.

When the woodlot is allowed to grow naturally it will protect itself considerably by forming a border of branches down to the ground on the edge of the forest such as a roadway or an open field. This prevents the wind from sweeping into the forest and overturning trees and checks the hot desiccating winds of summer from drying out the forest floor.

A large maple on the edge of a valuable sugar bush destroyed by fungus disease. The bracket-like fruit bodies may be seen on the trunk

Unfortunately, however, the border of the woodlot is one of the first parts to be removed, and consequently the wind is given every freedom. It should be kept intact and where it has been removed should be replaced with several rows of suitable evergreens.

Fire Only Does Harm

Fire is one of the worst enemies of the forest and the smaller woodlot, and every precaution should be taken to keep it out. It is especially dangerous at this time of the year when everything is so dry and there is little rain for weeks on end. In a few minutes through carelessness or the lack of a single precaution, the work of several years may be entirely wiped out.

Fire in the woodlot destroys the young growth up to ten and fifteen years of age. It burns up the humus and accumulated food of many years and robs the trees of moisture. It destroys the seed bed for new growth and, consequently, minimizes reproduction. On older trees it kills large areas of the cambium and opens the door for fungus and insect attack and necessitates the cutting of a high stump.

Where a small piece of woodland stands alone, there is little chance of fire. But where the danger from fire is imminent, either by proximity to larger forested areas, by the presence of grassy roadways or fields, or a railway right-of-way, some precautions should be taken.

Fires lines may be laid out consisting of a few feet of cultivated soil or a strip from which the brush and forest litter has been cleaned away. These should separate the woodlot from the source of danger and in case of fire will be a means of prevention or control.

Brush which has been allowed to accumulate during several cuttings is the owner's worst enemy in case of fire. This should be piled as cut and burned when snow is on the ground.

Cattle or stock of any kind in the woodlot are injurious to its best development. The damage inflicted is much the same in result as that cased by fire. The young growth is eaten down or destroyed, the ground is packed hard by their hoofs, roots are uncovered and injured and bark on larger trees is rubbed, and gnawed off. In the summer's heat at this time of the year, the dairyman or farmer with a woodlot is sorely tempted to give the cattle freedom therein if only for the cool of the trees. However, if it is found necessary to run cattle in the woodlot it would be preferable to fence off a section for this purpose. This would mean that a part of the area would be able to reproduce naturally and enjoy a period of protection, after which the fenced and open parts might be exchanged for grazing.

The Man Who Owns It

The worst enemy of the woodlot, however, is **often the man who owns it.** By lack of good judgment he may have at the end of a few years a woodlot filled with old, crooked and misshapen trees. No thought of a future crop is given; the best trees are cut for fuel; the border is opened up; the trees are thrown by the wind; cattle are allowed to browse during the summer and fire is permitted to ravage the area with the result that in a few years a piece of woodland, which was capable of supplying the farm with fuel and occasional pieces of timber, as well perhaps, maple syrup, becomes a tangle of upturned stumps and scrubby growth.

VEGETATION IN CANADA'S FAR NORTH

Plate reproduced by courtesy of Nat. Res. Int. Ser., Dept. of Interior.

Potato "Patch" at Fort Good Hope, fourteen miles from Arctic Circle and 970 miles north of Edmonton.

The Canada Lynx—A Snarling Savage

Some Interesting Characteristics of this Unlikeable Wild Cat Species

By Robert G. Hodgson

THE Canada Lynx and the Wild Cat are the two cats of the Lynx species found in North America. The home of the Lynx is in the cold snowy North, the species found in the South not being so large nor hardy as the Northern cousin.

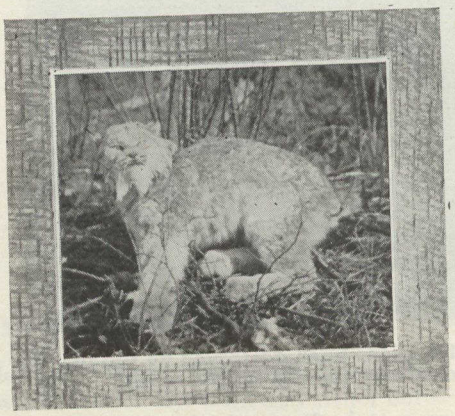
The lynx is a big-eyed, flat-faced, short-bodied, bob-tailed snarling savage. He is larger, has a shorter tail and longer fur than the wild cat. In size he is between a fox and a wolf, standing about one and one half feet high, with a length not over three feet, and weighs anywhere up to twenty-five pounds, twenty pounds being about the average weight.

The lynx's color is a pepper-and-salt mixture—silver gray on the back, paling towards the belly which is sometimes almost white. An under shade mixes and causes a mottled color. This color makes him unnoticed against almost any background and proves especially valuable to him when he is out hunting for food. On the sides of the neck and under the throat there is a ring or ruff of longer fur. The ears are small and pointed and on the ends have tufts of long black hair. The tail is short, the color at the base being the same as the back of the animal; towards the end it is black, while at the extreme tip it is white or almost so. In winter the fur is long and silky.

To the ancients, the lynx was an animal of great mystery and was supposed to be able to see through any object. There are many tales of Indian lore founded on the habits and general appearance of this animal. He lives in the darkest woods and swamps and feeds on rabbits, grouse, prairie dogs, squirrels, fish, birds, eggs and scraps of food left by other animals. He is a good swimmer and climber, his legs being very muscular and adapting him for most strenuous work in this direction. He will climb a tree and wait on an overhanging limb to pounce down upon some small victim but is a great coward and never attacks people as has been commonly stated. He will, when pressed by hunger, even prowl around the pioneer's cabin in search of food but a hen or a small pig or lamb is the largest thing that he will ever tackle.

Possesses Fatal Curiosity.

His sense of curiosity is great and he has been known to follow a logging team miles through the woods when there was a chain dragging behind the sleigh, which attracted his attention by the strange jingle.



The "Snarling Savage" at Bay.

Trappers commonly take advantage of this curiosity by setting traps and placing beyond the trap in the snow, a black feather, or by hanging directly above it a piece of red flannel. This latter article is swayed backward and forward by the wind and it seldom fails to attract the animals to the set trap where they are caught.

The chief food of the lynx is the northern rabbit which they can run down in a long chase even though their system of travel by galloping or by leaps and bounds, is clumsy. The lynx have been supplied by Nature, with large, furry feet which act in the same capacity as snowshoes and prevents sinking into the loose snow. Were it not for this they surely would starve in the North country. As it is, they are often forced to go hungry. Every seven years some sort of disease wipes out the rabbits of the North and as the Lynx depends on them for food almost entirely, many of them starve while the others are forced to migrate where they can secure a living much more easily. They are generally considered to be very stupid animals and indeed they are in most ways.

Tricked Even An Owl.

To prove however, that they also have cunning, I relate an occurrence a friend saw one winter in Alaska when the rabbits had been wiped out by the seven-year plague:

A lynx was out hunting when he saw a large owl perched on the limb of a tree, also out hunting—probably for mice. His Lynxship went back a short distance so that he could not be seen by the owl and burrowing under the snow, came up to where he was directly under the gaze of the winged hunter. Making a hole for his tail through the snow, he allowed it to show and then moved it back and forwards. The owl at once noticed the movement and was immediately interested. Thinking, no doubt, that it was a mouse, he swooped down and grabbed the tail, when the lynx emerging from beneath his covering of snow, seized the owl—and secured a fine meal for himself by his strategy.

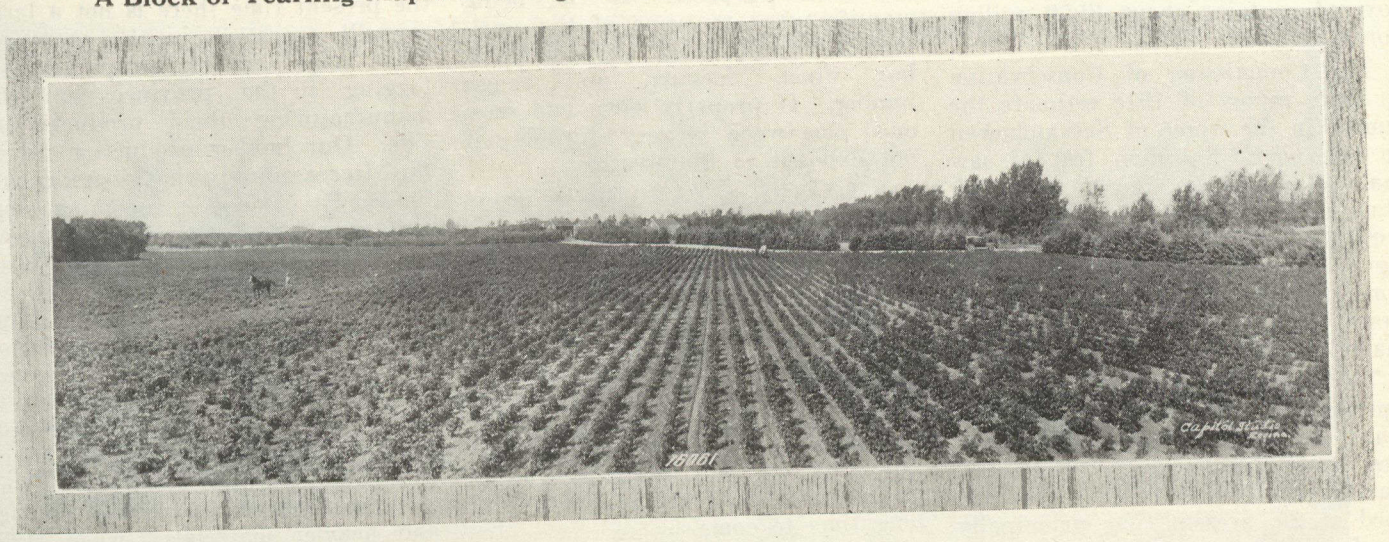
Lynx are also expert fishermen. They are known to lie across the top of a log spanning a stream and, when fish pass by, seize them in their mouth or scoop them out on the bank of the stream with a stroke of their paw. This method proves quite successful when the fish are spawning, for at that time they are invariably stupid and seek shallow water always. A lynx will chase birds and squirrels to the topmost branches of trees to catch them and will rob the nests of the birds whenever they can find them. At night when the rabbits are most active lynx hide along the trails and regular runways of the rabbits and catch them. When pressed with hunger they will eat even the flesh of their own kind, although it is doubtful if they would kill another of their species for this purpose.

Utter Murderous Scream.

Lynx have the power of uttering a scream unlike that of any other animal, and Mr. J. Burroughs, in describing this scream, says: "First a loud, strident, murderous scream, such as a boy might utter, when beside himself with fear or pain, followed by a long, tapering moan and wail like the plaint of a lost soul, that was almost blood-curdling. Five times with less than one-half minute in-

(*Continued on page 458*)

A Block of Yearling Maple Seedlings in the Forest Nursery Station at Indian Head, Sask.



The Forest Resources of Saskatchewan

Some Intimate Details Concerning Volume and Species

By E. H. Roberts, Assistant District Forest Inspector Dominion Forestry Branch

A HISTORY of the development of the forest resources of any country begins with a period of misuse, mismanagement, excessive waste and an absolute disregard of the future. So long as private interest and enterprise continue to exploit these resources unchecked and unrestricted, having regard only for the greatest individual gain in the shortest possible time, just so long will that state remain in its pioneering stage of careless abandon, extravagant use and needless waste of those resources.

Saskatchewan is now passing out of that period of mismanagement of its forests to more intensive management; from plentiful supply to decreasing timber production. A large majority of our people have not yet come to realize that next to agricultural products, forest products are indispensable to our present civilization and vital to the life of the nation.

Saskatchewan's total land area of 152 million acres is about equally divided between absolute agricultural lands and producing or potential forest lands. Nearly the whole agricultural belt lies south of the 54th parallel of latitude, while the greater part of the forest belt, commercially valuable at the present time or in the near future, lies between the 52nd and 56th parallels. Of the total forest area of the province about 32 million acres lie south of the Churchill river and is the most productive and important at the present time. That portion north of the Churchill, about 56 million acres, does not produce any commercially valuable timber at the present time but rather provides shelter for game and fur bearing animals. This territory is mostly a rocky country of lakes and rivers and it is possible that at some future time this vast area may become a producer of pulpwood and minerals. So far as we know it only contains small scattered blocks of timber along some of the water courses and these are hardly large enough for building logs.

The area I wish to treat with principally is the forest area south of the Churchill river and extending down to the edge of the agricultural belt. This area of about 30 million acres contains, at the present time, the commercially valuable tree species. There also exists about 2 million acres of essentially forest lands in the agricultural belt, the greater part of which have already been included in forest reserves.

Up to the present time the Federal Government has by a wise policy established some 16 forest reserves in the province, containing approximately 6 million acres. An additional 1½ million acres have been defined as proposed reserves but this still leaves over 25 million acres of land unfitted for any other purpose except timber production and without intensive management at the present time. This land has soil that is too poor, light, sandy, rough or wet for profitable farming and if placed under rational forest management, similar to that established on the permanent forest reserve areas, it would become a valuable asset in the future.

Only about 4% of Saskatchewan's total land area is now in permanent forest and when we compare this with some of the European countries like Sweden with 48% of her land area in permanent forest and Belgium, France or Germany with from 18 to 25% in permanent forest, we can see that these countries have retained as timber reserves areas far in excess of our province. From the statistics available it would seem reasonable that in this province we should have nearly 1/5 of the total land in permanent forest or 1/3 of the total land area south of the Churchill river should be permanently placed under forest management in order that this land may be put to its highest economic use.

Of the forest belt stretching across the province there has been about 17 million acres examined by the Forestry Branch which reported in 1918 that 41% was timbered, 18% burn, 33% muskeg, 8% grassland and water. The burn area has been somewhat increased by the fires in the spring of 1919. On the lands examined the report indicates that 75% of the timber was Aspen Poplar, 13% Spruce, 10% Jack Pine, 2% Tamarack, Birch and Bal-

sam. It was estimated that this area covered contains about 40-50 million cords of wood.

The Commission of Conservation in their report of 1918 estimate the timber in the whole of Saskatchewan to run about 8 billion feet of saw material of Spruce, Poplar and Jack Pine with an additional 125,000,000 cords of pulp and cordwood. These figures are liberal at the present time as there has been considerable destruction by fire since they were made.

The two most valuable species are Spruce and Jack Pine which readily make commercial products of lumber, ties, lath and pulpwood. Poplar, Tamarack, Willow and Ash are used at the present time principally for fuel and fence posts.

1. WHITE SPRUCE grows up to 3 feet in diameter on the stump and 90 to 100 feet in height. This tree will average 1 inch in diameter growth in 4 years. It matures at from 125 to 150 years of age. When manufactured it produces a No. 2 common lumber which is very suitable for a variety of purposes, particularly building construction. This wood is extensively used for paper pulp and also makes good lath.

2. JACK PINE grows up to 20 inches on the stump and from 60 to 90 feet in height. This tree will make fuelwood at 40 years and railway ties at 60 years of age. It matures at from 70 to 80 years of age, and is used to some extent for lumber. It makes suitable railway ties and is suitable for the manufacture of paper. It is largely in demand at the present time for fuelwood and ties. Vast areas of the northern part of the province are covered with thick stands of this species.

3. ASPEN or POPLAR is our most abundant tree species. Two distinct species grow in the province, one commonly called the Aspen or White Poplar, and the other the Balsam or Black Poplar. Both these trees usually mature at from 35 to 50 years of age and when about 12 inches in diameter on the stump and make a height growth of from 60 to 80 feet. The Black Poplar, in favorable sites, reaches diameters as great as 30 inches and closely resembles the Cottonwood. This tree is quite defective when it reaches its maximum and when mixed with White Spruce acts as an excellent nurse crop until such time as the Spruce over tops it and kills it off. The wood is mostly used for fuelwood at present but is quite suitable for numerous other purposes. It is being manufactured by some of the small mills for grain doors, elevator stock, box wood, flooring, and rough lumber. If properly sawn and seasoned this wood is very durable if not exposed to the weather.

4. LARCH or TAMARACK grows from 15 to 18 inches on the stump and from 30 to 70 feet high. The growth in diameter averages 1 inch in 8 years. This timber is used for structural purposes, railway ties, fence posts, and makes suitable lumber. Most of this timber in the province has been killed off during the past few years by the attack of the larch saw fly, and we cannot look for any large supply for quite a long time to come.

5. BLACK SPRUCE usually runs from 3 to 8 inches in diameter and from 35 to 50 feet in height. Growth is very slow, sometimes a 4 or 5 inch tree being 150 or 200 years old. This tree grows extensively throughout the northern muskeg areas, and is quite often found in mixture with Jack Pine or Tamarack. It has a very limited use at the present time, being taken out mostly for fuelwood and in some cases for lath. With the extension of the pulp industry this tree with the Jack Pine will find a ready market at some future date and can be found in great abundance in the north of this province.

6. PAPER BIRCH is commonly found through the north and in some places covers quite extensive areas. It grows from 4 to 10 inches in diameter and from 30 to 40 feet in height. This is the hardest wood of commercial value that we have in the province and where it is available is taken out to some extent for flooring, woodenware, implements, tool handles and fuel.

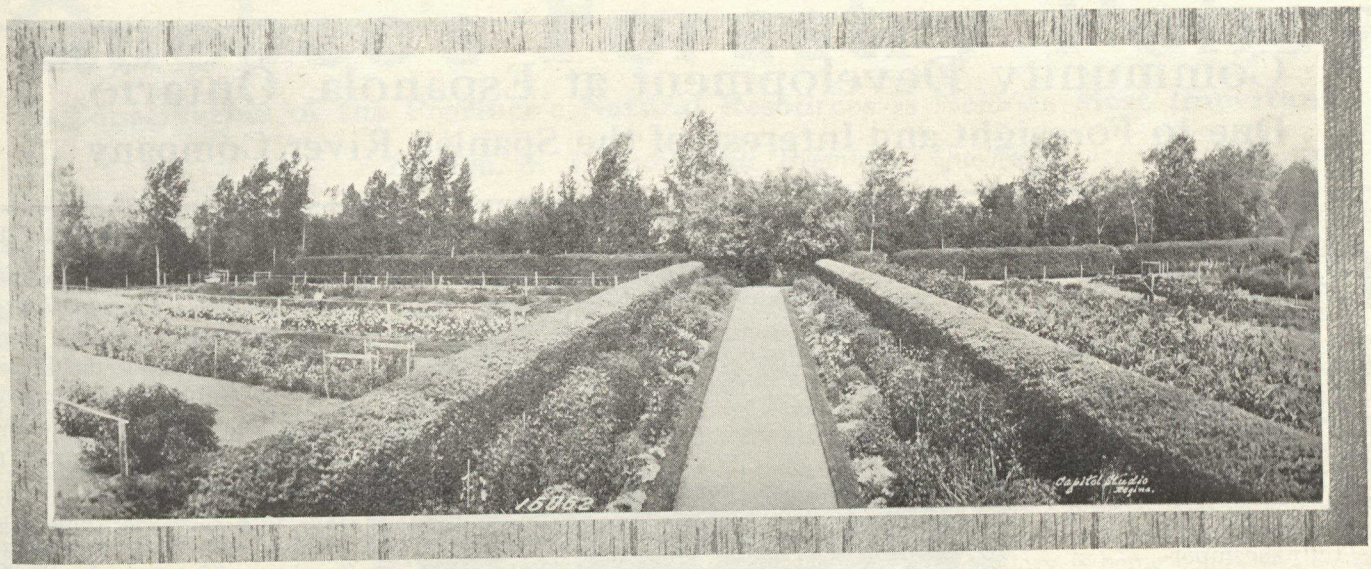
7. The Balsam, Green Ash, White Elm, Manitoba Maple and Willow are trees that are not widely distributed in the forests of this province. They all make most suitable trees for decorative purposes and are locally valuable and with proper management could probably be made to show profitable returns.

This province reached the peak of its lumber production in 1918 when the Saskatchewan mills cut 116 million B.F.; if averaged at $20.00 per M at the mill, the value of this product alone was over 2½ million dollars. However, since then, two of the largest sawmills in the prairie provinces have gone out of business and the production in 1921 amounted to only about 60 million B.F. At the present time there is not a large sawmill operation in the province. Two large lumber companies are logging in the province but are manufacturing their product outside. Our lumber production is on the decrease and what logging and lumbering is done is becoming more and more the business of the small portable mill. There are no large blocks of timber available and accessible which would attract a large sawmill. We have passed the period of plentiful supply in this province and it behooves us to look well to the future. Why should the people of Saskatchewan be paying heavy freight rates on the long haul from the Coast, especially on the rougher and heavier materials, when right here in our own province are vast areas of land whose soil is suitable for no other use than timber production? The lumber men and paper manufacturers, in the Dominion, are becoming well aware of the pending shortage of raw material within a few years and are seeking ways and means of increasing forest production and developing more efficient forest protection agencies.

Forest Administration and Protection in Saskatchewan is mostly a function of the Federal Government at the present time. The Province has a Prairie and a Forest Fire Act which is very complete but it lacks an organization to put it into effect and enforce its provisions. The administration of forest lands in the province is divided into two main branches, namely: the Crown Timber Branch which administers timber lands outside of forest reserves and on all licensed timber berths. The other, the Forestry Branch, who have charge, through the local District Forest Inspector at Prince Albert, of the management of the forest reserves in the province, the fire protection on all Crown Timber Lands and fire protection along R. R. lines in the timbered country.

The District Forest Inspector at Prince Albert has under his care 16 Forest Reserves in Saskatchewan of over 6,000,000 acres. The R. R. Fire Patrol is maintained by the Railways through timbered country and is inspected by a district fire inspector and an assistant in Saskatchewan, who travel along the right-of-way and look to the enforcement of Railway Commission Orders as regards reporting fires, clearing right-of-way and plowing fireguards.

The Fire Ranging Staff on Crown lands outside of Forest Reserves in that country lying between the



Perennial Herbaceous Border with trimmed white spruce hedges

North Saskatchewan and Churchill Rivers, consists of two district fire rangers, two sub-chiefs and 30 fire rangers with 20 assistants. This staff of fire rangers is only employed for about six months during the summer, from about April 15th to November 1st. Those men who patrol along the edge of settlements usually travel by means of saddle horse while those in the north country use canoes and motor boats. The average district contains 2,000 square miles, so you can realize that with this amount of territory to look after, one or two men can hardly be expected to have more than a moral effect in fire prevention. However, these men are most resourceful and are very active in putting out camp fires, warning travellers and fighting what fires as do occur, though they occasionally have a hopeless task by reason of not being able to secure the necessary help or supplies. These men could function more effectively if they were given appointments as fire wardens under the Provincial Act.

It is anticipated that within a short time we may have an air patrol established in the north of the province similar to those now in existence in nearly every other province in the Dominion. This work is carried on by the Air Board in co-operation with the Forestry Branch. The air patrol, however, does not completely solve the fire problem as there are many points of co-ordination with the ground force to be worked out, as the air patrol acts mainly as a detection agency and the fire has to be put out after it is discovered and reported. However, vast possibilities are predicted for it by those now engaged in the work.

The Forest Reserves are divided into two groups, the Prairie Group and the Northern Group. The former is composed of eight small areas distributed throughout the prairie belt composed mostly of waste land of no agricultural value, mostly very sandy or too rough for farming. The Northern Group consists of some quite large blocks of non-agricultural land, either now carrying commercial timber or having immature stands which need protection and management until such times as they become merchantable. These northern reserves also contain large areas that have been logged off and left by the lumber men and also much burnt over ground which, in some cases, is reproducing naturally to commercial species.

Each Forest Reserve is divided at present into Ranger Districts which average about 200 square miles. These districts being only one-tenth as large as the fire ranger districts, thus secure more protection and better management.

A Forest Ranger who is in charge of a district is a permanent officer employed the year long. Each Forest Reserve is composed of one or more districts under the direction of a Forest Supervisor, who has a technically trained Forester or Forest Assistant as his deputy or he is, in most cases, a technically trained man himself. At present there are ten technically trained foresters on Forest Reserves in Saskatchewan, and about 50 permanent forest rangers. The total personnel on forest reserve work in the province now numbers about 75 permanent employees and 25 seasonal or temporary assistants.

The first care of the Department was to provide living accommodation for their guardians of the forest and to this end there have now been built some 25 ranger houses, 30 cabins, 5 office buildings, 25 barns and stables. Numerous other small structures have also been built, such as: tool sheds, boat houses, speeder sheds, etc.

The next important item was to provide means of locating fires and communication. To this end 17 steel lookout towers, 30 wooden lookout towers and nearly 500 miles of telephone line have been built and maintained. Many miles of new roads and trails have been built and existing trails opened up and maintained. Miles of fireguards have been cut and plowed along reserve boundaries and along Railway right-of-way.

Fire protection is the first and foremost duty of every forest officer. Fire is the worst enemy of the forest. Millions of feet of timber are burned each year; much more than was ever cut has gone up in smoke. The causes of forest fires are divided as follows: 1/3 due to settlers, campers and travellers, 1/5 due to Railways, 1/10 other known causes such as: lightning, etc., and 1/3 unknown.

The year 1922 was considered a fairly favorable season, yet 50,000 acres were burned over on the forest reserves or almost 1%. Our largest expenditure for fire fighting was in 1919 when the Forestry Branch spent $50,000. In 1922 we spent about $1,500. This sum is outside the cost of ranger labor.

Fire protection divides itself into three divisions, namely: Prevention, Detection and Suppression.

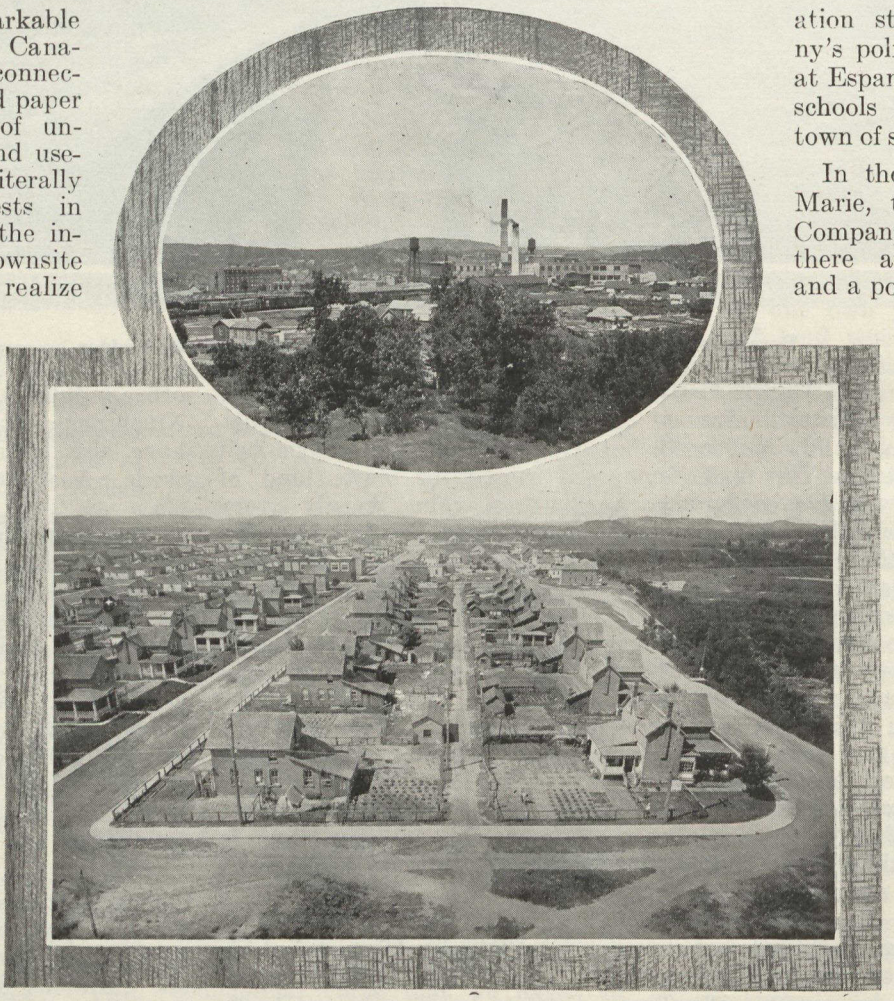
Prevention includes the removal of inflammable material such as brush from logging operations and dry hay and grass from meadows. Cutting

(*Continued on page 464*)

Community Development at Espanola, Ontario

Due to Foresight and Interest of the Spanish River Company

THE most remarkable development in Canada today are in connection with the pulp and paper industry. Townsites of unusual attractiveness and usefulness have been literally hewn out of the forests in the developments of the industry. To visit a townsite of this nature is to realize most fully the importance of such developments and those who have had the opportunity of inspecting Espanola will be impressed with the wonderful things that may be done if the will is present to do them. Espanola is unique in industrial townsites in the Dominion of Canada today and stands as a permanent monument of the pioneering spirit, foresight and town planning ability of Canadians.



Below—Birds-eye view of the townsite of Espanola. Above—News print mill of the Spanish River Pulp and Paper Mill Ltd., Espanola, Ont.

Four thousand people live in Espanola. The location of the newsprint mill of the Spanish River Pulp and Paper Mills, Ltd., has induced these people to settle in this region, which formerly was a wilderness. The Spanish River Company believes that people engaged in the manufacture of its product are those who determine its success, and therefore has taken care and thought to develop a high standard of social life and maintain agreeable working conditions.

The Spanish River Company is responsible entirely for community development at Espanola as this townsite is at present unorganized. Espanola includes in its equipment intended to develop the best type of community life, the finest athletic fields in Northern Ontario, for football, baseball, tennis, track events, open air dancing, indoor skating, curling, as well as sand piles, swings and pools for children.

Better education being the foundation stone of the Company's policy, it has constructed at Espanola two of the finest schools to be found in any town of similar size in Ontario.

In the city of Sault Ste. Marie, the location of the Company's largest plant, there are other industries and a population surrounding them of 23,000 people. The Spanish River Company and its staff in mills and offices are constantly furthering its community development.

At Sturgeon Falls, the paper mill is the largest industry and the town of 5,000 people looks to this industry for its lifeblood.

Approximately 2,000 men are employees in the three mills of this Company, and some 5,000 are engaged in the Woods' operations. The vital statistics of the Company show that approximately 30,000 Canadians are dependent upon the Company for their maintenance.

The Company is producing 680 tons of newsprint per day which is used to carry the news of the world to the people of the world. The annual payroll of the mills, only, amounts to $2,500,000, in addition to the Woods' labour which approximates $2,000,000 per annum.

Quebec's Forestry Policy

Conservation of the Province's Natural Resources is Held as Most Important

By Hon. L. A. Taschereau, Premier of Quebec.

STATE control is a political theory which is no more in honor with the present legislators of the Province of Quebec than it is with the public, no matter what we think and say about it. But that government would lack courage which, for fear of being criticized by its opponents, refrained from taking the initiative and its share of responsibilities which it should assume in things intellectual and moral. Its weakness would be subject to repudiation if, to crown it all, it declined, in things material, to play the leading part assigned to it.

Where this part fully asserts itself is in the administration of the natural resources. The whole country benefits by the utilization of these resources, and ruthless exploitation of them would bring about their deterioration. Not only should they serve the present generation, but they should be preserved for future generations.

Of these resources, the forests are considered the most important. They are the very soul of the many factories. From them are derived the vitality and power of the hydraulic energy so essential to the activity of a great variety of industries.

The forests can retain their usefulness only in so far as the State holds control of them. On account of its perpetuity, the State alone can adopt policies best fitted to the conservation and administration of the forests. What is needed, in this connection, is a general stable policy to cover a long period of time; a policy which to be of real advantage should be continuous. This is the feature of the situation which the Government of the Province of Quebec has so well understood.

Measures re Exploitation

A correct idea could be formed by studying the different legislative measures passed by this Government. In the first place, it does not divest itself of the ownership of the timber limits, but leases them to those lumber concerns which can use them to best advantage. In order to prevent careless cutting, these concerns or limit holders are governed by severe regulations.

By careless and excessive cutting, more wood is taken from the forests than the annual growth and trees intended to regenerate the forest are cut down. In establishing the diameter limit of trees to be felled, in forbidding the cutting of the trees that have not yet reached maturity, although they may be fairly large, the Government ensures the conservation of its forest wealth and of a sufficient number of trees for regeneration purposes. When more progress is made in the stocktaking of our forests, and it is with such an object in view that Article 1597a of the Provincial Statutes is being enforced, it will be possible for us to base the exploitation of the forests strictly on their yielding capacity.

Our activity is not limited to the prevention of excessive cutting. Special regulations compel the lumbermen to take from the tree all the merchantable timber it can possibly supply; the cutting of wood is thus made more and more economical, for a more complete output is obtained from the trees felled. By granting certain privileges, we encourage the felling of trees which have been damaged by fire, injured by insects or which are considered of an inferior commercial quality. This work of weeding and improving the forest contributes to its pr

Leasing of Timber Limits.

The forests that are not yet exploited may very well be compared to an improductive capital. In such forests, insect pests, diseases and decay destroy, every year, a great quantity of wood which could be used in industry. The Government is endeavouring to remedy such a state of affairs by leasing those forests which, on account of their conditions, are best suited to an advantageous exploitation and which industry is anxious to make the best of.

For the last few years, the Government has been putting the new limit holders under the obligation of exploiting concurrently the forest and the water-falls therein. It is on account of this policy that important forest industries have been established in our province.

Prohibition to Export of Unmanufactured Timber

That which, however, has contributed more to this result is, without question, the Order in Council of 1910 which prohibits the exportation of unmanufactured timber cut on Crown Lands. This legislative measure will have marked the starting-point of a wonderful prosperity in the pulp and paper industry in the Province of Quebec.

Forest Inventory

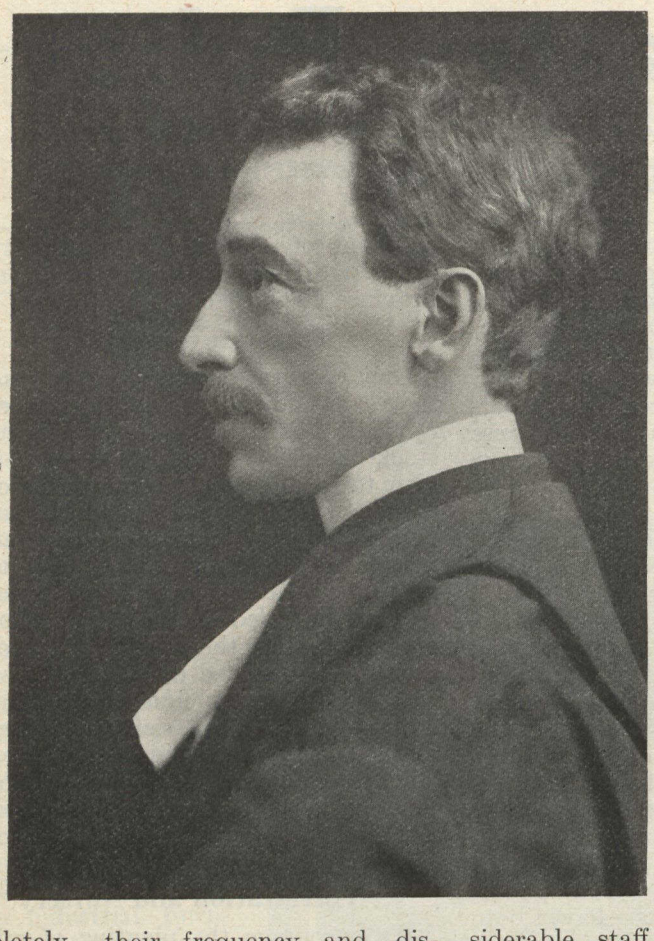
Our concern for the forests and their subsidiary industries goes further. We have been engaged in the stocktaking of the forests with a view to having a better knowledge of the quantity of wood on which can depend industry and commerce. Entrusted to a staff of experts, this inventory is being completed by aerial surveys intended to show by means of photographs the true features of each of our wooded districts. When this stocktaking is finished, we will encourage in each district the forestry methods best suited to the soil and climatic conditions, and which are the most fitted to assure the reconstitution of the forest with trees of real commercial value.

Re-Forestration and Nursery

To encourage the planting of valuable trees on spots where Nature has been unable to rebuild the forest, and where fires, insects and ruthless cutting have hindered this work of regeneration, such is another part of our programme. It is with this end in view that the Government established, in 1910, a forest nursery station where millions of saplings of all kinds are grown. Hundreds of thousands of these are sold and shipped, every year, to different parts of the province, to be used in re-forestration. Among the trees so cultivated and distributed in our forests, there are several exotic species which we have succeeded in acclimatizing. These species of great value to industry and commerce are bound to considerably enrich our forest territory.

Protection Against Forest Fires

Re-forestration is absolutely necessary where fires have wrought disasters and where Nature seems to be powerless in growing a new forest on the ruins of the old one. At the same time, it is evident that it is preferable not to resort to artificial re-forestration. This is why we should, above all, assist the forest to retain its recuperating power. Therefore, not only must the forest be carefully and judiciously exploited, but it must be protected against its worst enemy. Although it may be physically impossible to stop forest fires com-



HON. LOUIS ALEXANDRE TASCHEREAU

We present herewith an article specially written, in French and English, for the "Illustrated Canadian Forestry Magazine" by Honourable Louis Alexandre Taschereau, M.L.A., LL.D., Premier and Attorney-General of Quebec. Premier Taschereau is head of the Law firm of Taschereau, Roy, Cannon, Parent & Fitzpatrick, Advocates, 139 St. Peter St., Quebec, P.Q. He was born at Quebec, March 5th, 1867, the son of Honourable Jean Thomas Taschereau, Judge of the Supreme Court, and Josephine (Caron) Taschereau, daughter of Honourable R. E. Caron, formerly a member of the Quebec Judiciary and subsequently Lieutenant-Governor of the Province of Quebec. He was educated at Quebec Seminary and Laval University, obtaining at the latter, his LL.L, in 1889, and LL.D. in 1908. He was called to the Bar in 1889, and began his professional career as partner with Sir Charles Fitzpatrick. When extradition proceedings were taken by the United States Government against Gaynor and Greene in 1902, Hon. Mr. Taschereau acted as Chief Counsel. He was Syndic of the Quebec Bar between 1908-9, Batonnier of the Bar for the District and Province of Quebec, 1911-12. He was an Alderman of the City of Quebec from 1906-8. Premier Taschereau entered the Provincial Parliament of Quebec as Member for Montmorency in 1900, being re-elected in 1904. He became Minister of Public Works and Labor in October, 1907, being subsequently re-elected to Parliament in succeeding Provincial elections. He succeeded to the Premiership of Quebec in 1920 upon the retirement of Sir Lomer Gouin, now Minister of Justice in the Dominion Government. Hon. Mr. Taschereau has instituted many excellent policies during his tenure of office and has added very considerably to his reputation as a parliamentary leader. He is an ardent out-door man, seeking much of his out-door recreation in fishing and hunting expeditions. He is a firm friend of Forestry Conservation and in this respect serves as an able protagonist of all constructive legislation.

pletely, their frequency and disastrous results can however be considerably minimized.

It is to such a task that the Government has devoted itself. In the first place, it has passed a law compelling the limit holders to patrol their forests during the dangerous season, to burn their slash lying near the railways. The most outstanding result of such a measure has been to bring together the limit holders in associations, in different parts of the province, with the object of looking after the forests more carefully and of fighting the fires more efficiently.

The putting into effect of the permit enactment, in connection with the slash burning and with travelling in the forest, has considerably improved the efficiency of the law. Henceforth, a permit must be obtained from the fire-ranger before clearing fires are set; the ranger selects the time when there is no danger of the fire spreading to the neighbouring woods. The compulsory permit issued to all those who wish to enter the forest, in summer, has the effect of reminding them that they must be careful in building camp fires. It also serves as a means of determining responsibilities in cases where forest fires are started.

In order to facilitate the application of these different legislative measures, the Government has organzed a special bureau with a considerable staff which is entrusted with the looking after and the patrolling of those forests that are not covered by the protective associations. This staff has an improved and modern equipment at its disposal; it has observation towers and hydroplanes to facilitate its work.

Technical Schools and Research Stations

The carrying out of this work of conservation and improvement of the forest requires scientific training. Consequently, the Government has established special schools. It has founded, in 1910, the Laval Forestry School where are recruited the foresters charged with the organization work and the application of forestry methods. A school for fire-rangers will be established this year for the training of an efficient subordinate staff which will be of great assistance to the engineers in their work.

At the last session, the Legislature passed a law providing for the founding of a paper school and a forest research station. The former is to train skilled help for pulp and paper mills. With such a school, industry will be the first to benefit by it, for it will thus be able to manufacture products of a superior quality. As to the artisan, he will find it advantageous, for his skill and his science will mean higher wages.

With regard to the forest research station, it is bound to bring about outstanding results. Its work will consist in gathering precise information in connection with the yielding capacity of the forest, the respective rate of growth of each commercial species, the readiness of certain valuable exotic species in acclimatizing themselves in our province, and the best means of favouring the regeneration of the forest in the process of exploitation. It will have a clear idea of the many uses to which the different woods can be subjected and will endeavour to find, both in the small and the large industries, outlets for species hitherto considered as of no value. It will guide as to the best methods whereby the quantity of waste in cutting can be further reduced, and to the most effective means of fighting the forest fires and epidemics of all kinds.

Forest Conservation in the Public Interest

In accomplishing such diversified works, our Government has no other object than that of assuring the preservation and improvement of the resources created by Providence for the benefit of future generations as well as of the present one.

We believe that we have succeeded in establishing a forest policy of which the Province is proud and by which Canada as a whole will benefit.

Politique Forestière dans Québec

Conservation des richesses naturelles

Par l'hon. L. A. Taschereau, Premier Ministre de la province de Québec

Nous publions dans le présent numéro un article que l'hon. M. L.-A. Taschereau, premier ministre de la province de Québec, a bien voulu écrire pour notre revue.

L'honorable Louis-Alexandre Taschereau, M.A.L., LL.D., premier ministre et procureur général de Québec, qui est à la tête de la raison légale Taschereau, Roy, Cannon, Parent & Fitzpatrick, 139 rue Saint-Pierre, Québec, P.Q., est né à Québec, le 5 mars 1867, du mariage de l'honorable Jean-Thomas Taschereau, juge de la cour suprême, et Joséphine Caron, fille de l'honorable R.-E. Caron, anciennement membre de la magistrature de Québec et, plus tard, Lieutenant-Gouverneur de la Province. Il a fait ses études au Séminaire de Québec et à l'Université Laval, où il obtint, en 1889, son degré de LL.L., et, en 1908, le degré de LL.D. Il fut admis au barreau en 1889 et commença sa carrière d'avocat comme associé de sir Charles Fitzpatrick. Quand des procédures furent prises par le gouvernement des Etats-Unis au sujet de l'extradition de Gaynor et Greene, en 1902, le premier ministre Taschereau était conseil en chef. Il fut syndic du bureau de Québec de 1908 à 1909, et bâtonnier du district et de la province de Québec en 1911 et 1912. Il fut échevin de la cité de Québec de 1906 à 1908. L'hon. M. Taschereau fut élu au parlement provincial en 1900, comme député de Montmorency; il fut réélu en 1904. Il fut nommé ministre des Travaux publics et du Travail en octobre 1907. Il a toujours été réélu député. Il fut choisi premier ministre de la province de Québec en 1920, succédant à sir Lomer Gouin, actuellement ministre de la Justice dans le gouvernement fédéral. L'hon. M. Taschereau a inauguré d'excellentes politiques depuis le commencement de sa carrière et s'est fait une réputation enviable comme leader parlementaire. Il est un amateur des sports en plein air, surtout la pêche et la chasse. Il est un ami sincère de la cause de la protection des forêts, et a fait passer à ce sujet des lois très utiles.

L'ETATISME est une théorie politique qui n'est pas plus en faveur chez les gouvernants actuels de la province de Québec qu'elle ne l'est chez le peuple, quoi qu'on en dise et qu'on en puisse penser. Mais un gouvernement serait peu courageux qui, par crainte des malentendus que ses adversaires cherchent à créer, s'épargnerait de prendre la part d'initiative et de responsabilité qu'il lui incombe d'assumer dans les choses d'ordre intellectuel et moral. Sa faiblesse deviendrait une cause de prompte répudiation si, pour comble, dans les choses d'ordre matériel il se refusait de tenir le rôle prépondérant qui est le sien.

Là où ce rôle prend toute son ampleur, c'est dans l'administration des ressources naturelles. L'utilisation de ces ressources profite à tout le pays. Une imprévoyante exploitation peut en amener l'appauvrissement. Et elles doivent non seulement servir aux générations présentes, mais être conservées pour les générations futures.

Parmi ces ressources, les forêts sont considérées comme les plus importantes. Elles sont l'âme même de multiples fabriques. C'est d'elles que proviennent la vitalité et la puissance des ressources hydrauliques si essentielles à l'activité d'une grande variété d'industries.

Les forêts ne peuvent conserver leur utilité que dans la mesure où l'Etat en garde le contrôle. L'Etat seul peut, grâce à sa perpétuité, employer la politique qu'exigent la conservation et le sage aménagement des forêts. Il s'agit là, en effet, d'une politique d'ensemble, à longue échéance, dont la continuité est une qualité indispensable. Et c'est ce que le gouvernement de la province de Québec a parfaitement compris.

Mesures législatives concernant l'exploitation

On peut s'en rendre compte par les différentes mesures législatives que ce gouvernement a adoptées. Et d'abord, il ne se départit pas de ses concessions forestières, mais les loue aux industriels qui peuvent le mieux en tirer parti. Pour y prévenir les coupes abusives, il impose aux concessionnaires de rigoureuses obligations.

Les coupes abusives sont celles qui demandent à la forêt plus de matière ligneuse qu'elle n'en peut annuellement fournir, celles qui enlèvent les arbres destinés à assurer la régénération du domaine exploité. En fixant le diamètre auquel les arbres peuvent être abattus, en ne permettant que l'exploitation des arbres qui sont arrivés à maturité et qui ont un diamètre assez considérable, le gouvernement assure la conservation de son capital forestier, et le maintien sur le sol d'un nombre suffisant d'arbres pour l'œuvre de la régénération. Lorsque l'inventaire de nos forêts aura fait plus de progrès, et c'est ce à quoi tend l'application de l'article 1597a de nos Statuts provinciaux, il nous sera possible d'obtenir que l'exploitation soit strictement proportionnée à la possibilité de la forêt.

Notre activité ne se limite pas à empêcher les coupes abusives. Des règlements spéciaux obligent les exploitants à tirer parti de tout le bois marchand qu'un arbre peut fournir. Les coupes forestières sont ainsi rendues de plus en plus économiques; et il se fait une utilisation plus complète des arbres abattus. En octroyant certains privilèges, nous encourageons l'abatage des arbres qui ont été endommagés par l'incendie, de ceux qui ont été dépréciés par les insectes et de ceux qui sont considérés comme des essences commerciales d'inférieure qualité. Cette œuvre d'épuration et d'amélioration contribue à la préservation de la forêt.

Affermage de concessions forestières

On sait que les forêts qui demeurent inexploitées peuvent assez exactement s'assimiler à un capital improducteur. Dans ces forêts, les épidémies d'insectes, les maladies et la vétusté détruisent, chaque année, un fort volume de matière ligneuse qui pourrait servir les fins de l'industrie. A cet état de choses, le gouvernement s'efforce de remédier en affermant les

forêts qui, par leur situation, se prêtent à une exploitation avantageuse, et dont l'industrie demande à tirer parti.

Depuis quelques années, le gouvernement met les nouveaux concessionnaires dans l'obligation d'exploiter concurremment la forêt et les chutes d'eau qui en dépendent. C'est à cette politique que nous devons l'établissement, chez nous, d'importantes industries forestières.

Prohibition d'exportation des bois non ouvrés

Ce qui, cependant, a le plus fait pour amener ce résultat, c'est indiscutablement l'arrêté ministériel de 1910, lequel prohibait l'exportation des bois non ouvrés coupés sur les terres de la Couronne. Cette mesure législative aura été le point de départ d'une merveilleuse prospérité pour l'industrie des pâtes cellulosiques et du papier dans la province de Québec.

Inventaire forestier

Notre sollicitude pour les forêts et pour les industries qui en sont tributaires ne s'arrête pas là. Nous nous sommes occupés de multiplier les inventaires pour parfaitement connaître les ressources de matière ligneuse sur lesquelles l'industrie et le commerce peuvent compter. Faits par un personnel de techniciens, ces inventaires se complètent par des reconnaissances aériennes destinées à montrer, à l'aide des photographies, la physionomie propre de chacune de nos régions boisées. A la suite de ces inventaires, nous encourageons dans chaque région l'emploi des méthodes sylvicoles qui s'adaptent le mieux aux exigences du sol et du climat, qui sont le plus capables d'assurer la reconstitution de la forêt avec des essences de réelle valeur.

Reboisement et pépinière

Favoriser les plantations d'essences de valeur là où la nature se trouve impuissante à reconstituer la forêt par ses seules forces, là où l'incendie, les insectes et les coupes abusives ont compromis cette réfection, tel est encore un autre article de notre programme. C'est à cette fin que le gouvernement créait, en 1908, une pépinière où sont cultivés plusieurs millions d'arbres de toutes sortes. Des centaines de milliers de ces arbres sont vendus et expédiés chaque année dans différentes régions de la province, pour y servir au reboisement. Parmi les essences ainsi cultivées et introduites dans nos forêts, il y en a plusieurs d'exotiques, que nous avons réussi à acclimater. Ces essences de grande valeur pour l'industrie et le commerce sont susceptibles d'enrichir considérablement notre domaine forestier.

Protection contre les incendies forestiers

Le reboisement est une œuvre qui s'impose là où l'incendie a exercé ses ravages et où la nature semble impuissante à faire renaître une forêt nouvelle sur les ruines de l'ancienne. Mais il est évident qu'il vaut mieux n'avoir pas à recourir au reboisement artificiel, et nous devons avant tout nous efforcer de conserver à la forêt sa puissance de survie. Cela implique que la forêt, non seulement doit être exploitée avec sagesse, mais qu'elle doit surtout être protégée contre son plus terrible ennemi, l'incendie. S'il est humainement impossible d'éliminer complètement les incendies forestiers, on peut cependant en réduire la fréquence et la gravité.

C'est ce à quoi s'est appliqué le gouvernement. Il a d'abord adopté une loi pour obliger les concessionnaires à faire la police de leurs forêts, durant la saison dangereuse, à brûler les déchets d'abatage qui gisent à proximité des voies ferrées. Le résultat le plus clair de cette loi a été d'amener les concessionnaires à se grouper en associations dans diverses régions de la province, pour faire une surveillance plus suivie, et lutter plus efficacement contre l'incendie.

La mise en vigueur du permis de brûler et du permis de circulation est venue renforcer cette législation. Désormais, les feux d'abatis ne peuvent être allumés qu'avec l'assentiment d'un garde, qui choisit le moment où il n'y a aucun danger que ces feux se propagent à la forêt voisine. Le permis de circulation obligatoire pour tous ceux qui veulent aller en forêt l'été, est une façon de rappeler les précautions à prendre en faisant du feu. Il est un moyen de fixer les responsabilités des conflagrations qui peuvent se produire.

Pour faciliter l'application de ces diverses mesures législatives, le gouvernement a créé un service spécial composé d'un personnel considérable qui s'occupe tout particulièrement de faire la surveillance et la police des forêts où les associations n'étendent pas leur activité. Ce personnel dispose d'un outillage perfectionné. Des tours d'observation et des hydroplans l'assistent dans sa tâche.

Ecoles techniques et stations de recherches

L'exécution de ces œuvres de préservation et d'amélioration de la forêt exige un entraînement scientifique. Le gouvernement s'est, en conséquence, préoccupé d'établir des écoles spéciales. Il a fondé, en 1910, l'Ecole forestière de Laval, où se recrutent les ingénieurs forestiers préposés aux travaux d'aménagement forestier et à l'application des méthodes sylvicoles. Une école de gardes sera établie cette année pour la formation d'un personnel subalterne averti, qui sera d'une grande utilité aux ingénieurs dans l'exercice de leurs fonctions.

A la dernière session, la législature votait une loi pourvoyant à la création d'une école de papeterie et d'une station de recherches. La première est destinée à la formation d'une main-d'œuvre expérimentée pour les usines à pâte et à papier. De cette création, l'industrie sera la première à bénéficier, puisqu'elle se trouvera en mesure de fabriquer un produit de meilleure qualité. L'ouvrier en tirera lui-même avantage, puisque son habileté et sa science lui assureront une rémunération plus élevée.

Quant à la station de recherches, elle ne peut que rendre des services signalés. Elle a, en effet, pour tâche de recueillir les renseignements les plus précis sur les possibilités de la forêt, sur la rapidité avec laquelle chaque essence commerciale s'accroît, sur l'aptitude de certains arbres de valeur exotiques à s'acclimater dans notre province, sur les meilleurs moyens de favoriser la régénération du domaine exploité. Elle se rendra compte des multiples usages auxquels les divers bois peuvent se prêter, et s'occupera de trouver dans la petite et la grande industrie des débouchés aux essences jusqu'ici considérées comme sans valeur. Elle avisera aux meilleures méthodes d'exploitation pour réduire davantage le volume des déchets forestiers, et à celles qui sont les plus efficaces pour combattre la propagation des incendies et des épidémies de tout genre.

La préservation des forêts est d'intérêt général

En accomplissant des œuvres aussi variées, notre gouvernement n'a d'autre objet que d'assurer le maintien et la propagation des ressources créés par la Providence pour le profit des générations futures autant que de la présente génération.

Mais, nous croyons avoir réussi à édifier une politique forestière dont la province de Québec a sujet d'être fière et dont tout le Canada, en somme, bénéficiera.

SOME HINTS ON TREE PRUNING

By Archibald Mitchell, Western Lecturer Canadian Forestry Association

PRUNING; what is the best time to prune and how should it be done? are questions we are constantly meeting.

The pruning of a tree is a surgical operation and just as a surgeon has to have a knowledge of anatomy before he can perform his operation, so should the tree pruner know something of the life process of the tree before he can be a successful pruner.

Pruning is the removal of certain branches from a tree for a specific reason, as for instance we prune a fruit tree so that its life functions may be directed towards the production of fruit instead of wood, and we remove a dead branch because it is diseased and unsightly. But the question is usually asked in connection with street trees or plantations which is an entirely different matter.

Pruning Street Trees

A street tree, or a lawn tree, is for ornament, and here we want a straight tree with a clean stem and a large well-balanced, branchy head. Beauty and symmetry are all-essential in an ornamental tree and the pruning we do must be directed towards these ends. The branches should be firmly attached to the tree so that they will not split off in a wind storm or after a heavy fall of wet snow. Any that do not appear to have a strong enough crotch should therefore be removed, but in doing so care must be taken to preserve the symmetry and balance of the tree. It is often better to shorten a branch and preserve the symmetry than to remove it altogether. Shortening the branch too, lessens the leverage in a storm and it is less likely to be broken off. Usually about half of the branch is enough to take off and the cut should be made just above a small branch on the upper side or to the windward.

A clean bole up to 7 or 8 ft. on a shade tree is most desirable, but many people make the mistake of pruning their trees too soon to get this effect. They cut, or rub off, all the lower branches from 4 to 5 ft. up or more when the trees are small, and often defeat their own ends in doing so. They forget that the tree requires a certain number of branches for its life functions and if too many are removed, it at once proceeds to restore them by sending out a lot of shoots from the stem or suckers from the roots which have in their turn to be removed.

The root action of a tree is accurately balanced by the foliage action, for the leaves are there for one purpose only, to expose the sap sent up by the roots to the action of the sun and the air in order that wood substance may be formed for the building up of the tree. It is able to adjust itself to the loss of a few branches, but when the pruning is too severe it has, in mere self-defence, to send out what new branches it requires. It pays therefore, not to over-prune. A few branches every year is far safer pruning than the making of the desired clean stem all at once.

There is also the danger of the tree becoming top-heavy and breaking over in a wind when a clean stem is made too early. After the wood-making substance is formed in the leaves it flows down the stem of the tree to be used by the wood-building cells and as it descends, the stream naturally gets thinner, the timber layer is smaller, and the tree stem loses its taper. The upper part grows thicker than the lower with often an over-development of the upper branches, and the tree becomes top-heavy. If a few branches are left further down the stem, they act as tributaries to the sap-stream, a full supply is provided all the way down, and the balance of growth is maintained. After a few years the stem gets quite strong and this tendency to top-heaviness disappears. It is better to proceed with caution when pruning a tree. Underdo rather than overdo is a good motto in tree pruning.

Best Time to Prune

The best time to prune is late May to July, and the cut should be made close to the tree. At that time healing of the wounds takes place very quickly and there is little danger of disease entering. When a spike is left it may take years to heal over. Disease germs enter through the pores of the wood and as long as these are left open and exposed to the air, there is always danger. The rapid growth of early summer soon covers the wound with bark, the natural wood cover, and it is safe from infection.

While early summer is the best time to prune it is not unusual to prune any time during the year with most trees, and usually it is quite safe. It is best, however, when wounds are an inch or over in diameter to fill up the wood pores with paint. The paint should be about the color of the bark and should not be too thin as it may run down the tree and look unsightly. If the wound is large, the paint should re renewed every other year till it is healed up.

Maples or Birch should not be pruned over winter or early in spring as they bleed readily before growing begins. It is better to wait till the growing season when the sap is being used by the tree as fast as it comes up from the roots. Then there is no bleeding.

Pruning is a very simple matter but it requires good, sound judgment on the part of the pruner whose work will be all the better for a little knowledge of the life-processes of the tree.

Above all, do not over-prune. It is easy taking another branch off if necessary, but impossible to put one back.

PRAIRIE-GROWN VEGETABLES

Can luscious vegetables be grown on the 'Windswept prairie'? Not usually until the wind is modified by a dense shelter belt of trees. Note this happy result on a farm that by adding tree shelter also added vegetable crops.

FOREST FIRES

Written for the Montreal Star by Maurice B. Caron

ALL too frequently, the school teachers of geography at the plastic time of youth have said to us "Canada, the land of boundless forests." How well might have been added, "Boundless forests, but for the hand of the bounder." The lesson at school and the oratory in the assembly hall tickled our hearts at the time and sent thrills of pride down our spines. Poor fools we were in those days. We believed the rubbish. The teachers, good souls, taught their lesson in much the same spirit as our class presidents carried Union Jacks to the assembly halls on days of national squeal.

A pall of heavy smoke hung over this city last week. People in the street gazed at it. Some ventured the idea that it was the end of the world. Knowing heads said "Forest fires." The end of the world business may have sounded rather humorous to some, but to the man of experience there was truth in it. Canada without her forests appeared before him as a sickly dame. Crowds were asking her for papers, magazines, time tables, income tax forms, anything in the way of paper. She was hanging her head, poor woman, in a very embarrassing situation, naked, cold, no furs to cover her, bad water to drink, no wood for shelter, none for fire when she really needed it, horribly unfortunate. Yet those crowds were calling for paper. The paper market looked like a pile of marks with a Ruhr situation setting a match to it. While we can say that the end of the world omen is bunkum, we must admit that Canada is beginning to squirm under the strangle hold, in which she is gripped. This sort of thing goes on from year to year so much so that we have grown to expect it, very much like a Christmas present without the tree. We clap our country on the back at budget time, once a year saying (softly at first) "Never mind old lady, do better next time." Oddly enough, she does better, like a horse under the whip. Her natural resources, the horse, we, the burden. Yet she's a good horse. Let some of us get off, lessen the burden, clean her stall, sow a few decent oats, then come back and jump on again. Then she will carry us.

Fire prevention rings in our ears day by day but are we growing better and better? Answer, but be honest. The newspapers tell us all about the great fires in northern Quebec and Ontario, Western Canada, Northern Canada, everywhere in Canada. They tell us where they are, what their losses, when they started. How they will end, God alone knows. We see this in print, but optimism, dangerous trait of the race informs us that all will be well, and besides, "why should you as an individual worry about the things you can't see. Take a holiday, old worried brow, and get a pack on your back."

The suggestion sounds well and out we go into the woods.

* * *

"Remember that clump of spruce opposite your place?"

"Yes, why?"

"All charcoal now."

This sort of thing greets us at the station anywhere in the mountains. We leave the station, and after a ride along a road, once beautiful, we reach our camping spot. The fire has spared our little patch. Our neighbour who owned the clump of spruce owns now something worth about half a dollar.

"Poor devil," we say, sympathetically of course. "But let's think of pleasanter things. A little trout for supper, what say?" the canoe goes out from shore with all the boys aboard "Stroke" says the man in the bow, "Stroke" adds the man in the stern.

"What about the little camp fire?" suggests the oldest man in the party.

"Now, old timer," comes the reply from the tenderfoot, "It'll take care of itself."

The fishing is not particularly good. The stream that used to run through the patch of spruce has dried up. There are no trout at the mouth this year. After an exhaustive casting we secure a few fish for supper.

Our little fire, a quarter of a mile away looks very cheerful. The evening breeze is springing up, the sparks fly. As we approach, the breeze cat-paws the water. Little wavelets form. Big waves grow. The little breeze becomes a wind—one of those nice head winds. The little fire grows to be a monster. The trees take a liking to it and away they go in one huge flame. The chorus in the canoe, in the happy way that choruses have, shouts, "Another good camp gone wrong." Our little episode ends with one of those quiet country scenes—a road, a dazed fishing party trudging homeward with empty flasks. The moral of the little story is, "Leave a man in camp when the fire is going. That fellow can save a forest."

The country is doing what it can to protect the forests, the lumber companies of necessity are doing the same. What part do you play in the scheme of things? The rangers are keeping the trails open for the hunter and the fisherman.

The water is kept in the lakes by protecting the forests. Partridge live better in shade-tree patches than in brules.

* * *

So when you cut down a tree, plant two. Forests take forty years to grow while a man grows old in forty years. The fire losses of this year, are equal, so far, to the amount of lumber legally consumed last year. Forest fires are a direct blow at the present and potential life of the Dominion.

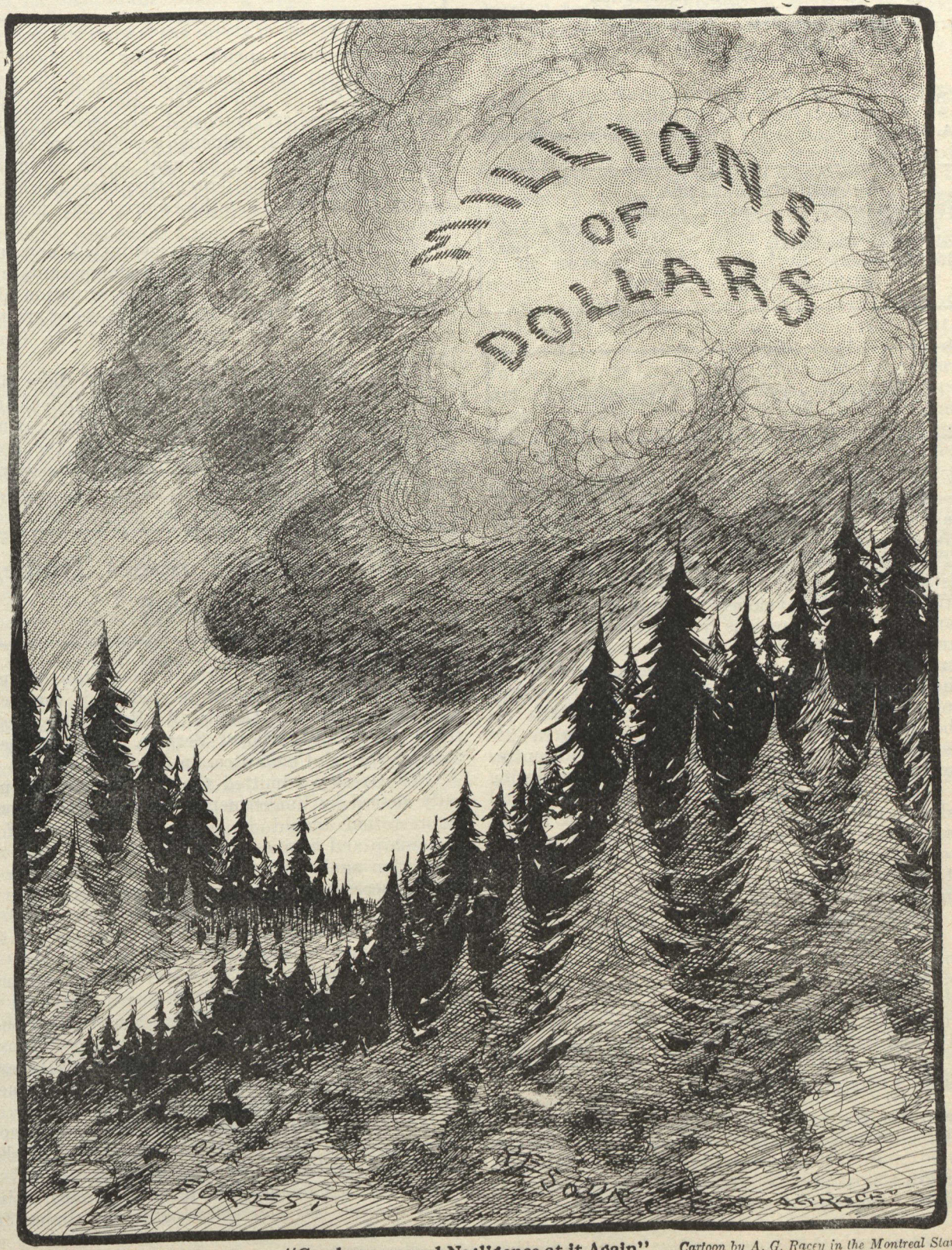
The Minister of Lands and Forests, the Hon. Honoré Mercier, has left Montreal for the fire-stricken areas of the province. He plans to arrange for forest permits again this year. He reminds us that a permit is necessary for the public to enter the forests.

Will the public follow the Minister, or will it follow the preachers of the policy of catch as catch can—the policy that throws thousands out of employment and lowers by many notches the property value of the Dominion.

If you don't know anything about the forests go to see them while they last. If you know, see them again, plant some trees and watch them grow. Come back in forty years and say with the forests, "Take a look at me now. You made me what I am for thirty cents."

UP IN SMOKE

Reproduced in conjunction with the article on the foregoing page through kindly co-operation of the "Montreal Daily Star."



"Carelessness and Negligence at it Again" *Cartoon by A. G. Racey in the Montreal Star*

E D I T O R I A L

ILLUSTRATED CANADIAN FORESTRY MAGAZINE

Published and Owned by

The Canadian Forestry Association

Standard Bank Bldg., Ottawa, Canada

ROBSON BLACK - - - - - - - - - - - Editor

GEORGE A. MACKIE - - - - - - - Publication Manager

SUBSCRIPTION RATES

With Membership in Canadian Forestry Association ..... $2.00 a year

Contributing Membership ..... $5.00 a year

Life Membership $25.00

SINGLE COPIES, 20 CENTS.

A Bonfire of Pay Cheques

RECENT forest fires, mostly started by human recklessness, have once more demonstrated how easily a country can kick out the props of its commercial future without being seriously aware of any wrong doing. The forest fires raging in Ontario and Quebec have been mistakenly called 'bush fires.' It was not the bush that burned, but pay envelopes. It was not trees that disappeared, but the precious raw material of 5,000 Canadian industries. We do not realize that with Canada's timber supply reduced to its present minimum of safety, every timber fire means lessened employment, injured water powers, and the sacrifice of industrial growth. It cannot be asserted too strongly that the forest areas are Canada's best bet today in planting new industrial centres in our non-agricultural North. We have witnessed, during the past fifteen years, the transfer of scores of pulp and paper industries from the United States to Canada for the sole reason that Canada offered adequate spruce areas, plus water powers. The movement into Canada is by no means at an end, but it is absolutely futile to expect any further industrial development of timber unless the plague of forest fires is fought and mastered right away. Ten times as much timber is being killed by human-set fires as is being used by all our mills. On one hand we have a picture of incoming industries, new towns, new population, new traffic for our railways, representing the power of thriving forests in nation building. On the other, we find the forest resources swept from the face of the Dominion by types of citizens who would blush with guilt if they burned down a neighbor's hen coop.

Joint Action Is The Cure

The cure for the forest fire plague is to be found in determined joint action of the common citizen and the state. The state now milks the forest as a source of revenue and puts back merely a modicum for fire prevention. No government has any right to use forest taxes for any other purpose than forest protection until the forest areas are on a self-perpetuating basis.

Stop all Spring Burning!

The customary spring burning of slash in New Brunswick may soon become a thing of the past. Forestry officials, to whom the safety of the province's forest resources are entrusted, are seriously considering the necessity of thus reducing a serious fire hazard which has recently been again brought to the attention of the entire province in the destructive fires which have been largely attributed to this source in northern New Brunswick.

While spring burning is conducted now under restricted regulations requiring special permits after May 15th, those in close touch with the situation claim that carelessness is still in evidence, while there are those who are always ready to "take a chance" in evading the law.

An investigation of the causes of these fires show that in many instances slash burning and clearing fires were started without the permits required. Burning in the fall under conditions which reduce the fire hazard and also under proper supervision is considered as the only proper solution.

Col. Greely Foresees Timber Famine

A "timber famine" already has begun in the United States, and will become worse before it can get better, was the assertion of Colonel W. B. Greeley, Forester of the United States Forest Service, testifying before the Senate Special Committee, in Washington.

Col. Greeley admitted that his views were not generally shared by lumbermen, but he took the ground that reforestation would be largely a matter of private ownership and business, provided the state gave adequate protection against fire and a system of taxation adapted to the necessary long period of tree growing. Many lumbermen, he said, believe that private capital will not generally undertake reforestation because of the long wait necessary before returns can be realized.

Colonel Greeley said the total of standing merchantable timber is 2,200,000,000,000 board feet, and that the ratio of depletion to regrowth is about four to one. Theoretically, without change in present conditions of regrowth and depletion, American forests will be exhausted in thirty to forty years. Experienced lumbermen, however, ridicule these statements.

While the actual amount of standing timber is still large, though 1,500,000,000,000 below what it should be to balance depletion and new growth, Colonel Greeley maintained that in effect the principal lumber using parts of the country are now suffering from "timber famine," resulting from the high freight rates caused by the long distances of the remaining forests from the consuming centres.

Extract from Article by Gene Stratton-Porter

in McCall's Magazine for April, 1923

The following extract has been circulated by Mr. F. J. D. Barnjum with the comment:—

"This warning applies with even greater force to Canada, for small as the remaining supply of timber in the United States now is, the stand in Canada amounts to less than one third of the supply in that country."

I HAVE lived to see the enormous prices set upon furniture made from walnut, oak, cherry, and bird's-eye maple. While writing this article, I read of a black walnut tree just sold in Indiana, from the stump of which alone, four thousand dollar's worth of fine veneer was to be made, and if the trunk were solid and proved to be as finely marked as was hoped, it would swell the value to unbelievable figures for a tree.

Who can estimate the appalling waste in the burning of those indiscriminate log heaps! I used to marvel at the gorgeous smoke ascending in wreaths and banners of lavender, pink, blue, red, gray from those green logs!

—o—

I have not been accustomed to considering myself among the oldest inhabitants; a fair degree of civilization had reached Indiana when I was born, yet, in my childhood I was acustomed to Indians at the door, to wild turkeys, wild cats and bear and deer in the woods not farther than Michigan from my home. We used to see wild pigeons in such numbers as to break down the branches of the beech, maple and linden trees on which they perched at night.

I was born at a period when, almost daily, huge wagons lumbered down our road, many of them drawn by oxen plodding a few miles each day on the way westward. The plains were covered with buffalo. We used the skins for sleigh robes and they cost from ten to thirty dollars a piece, depending on the size and condition. There was an abundance of game of every kind, the fish fairly crowded the rivers.

One of the commonest sights of my childhood was the ascending smoke in all directions from the burning of uncounted log heaps. And Oh! the pity of it! Those log heaps consisted of as fine trees as God ever made, felled where they stood and rolled together and burned **to get them out of the way.** Oak, hickory, beech, ash, elms, that almost swept the sky, wild cherry, bird's-eye maple, black walnut—trees that to-day would be sawed into thin sheets and used for the veneering of less expensive wood; trees for which any lumberman would pay from six to twelve and fifteen hundred a trunk, felled and burned in order to clear the ground upon which they stood for the cultivation of corn and potatoes. The resources of the country were considered so vast that it never occurred to any one to select the most valuable of these hardwoods, and store them for the use of future generations.

—o—

I have lived to see timber becoming so scarce that houses of stone, brick, and cement are resorted to through necessity rather than choice in many instances. I have lived to see the greater part of our springs dried up, the little streams drained from the face of the earth, and many of the rivers practically dry in the summer season, the lake levels lowered, the fish, game and fur-bearing, animals practically exterminated.

—o—

The deer and fur-bearing animals are practically gone from the country I knew and the country further west as well. Many of the Indians are nearly starving through the scarcity of fish and game. The birds have been depleted in numbers until it is quite impossible to raise fruit of any kind without a continuous fight against slug and aphis, a war which birds in sufficient numbers would wage for us.

—o—

With the cutting of our timber has come a change in our climate; weeks of drought in summer and destructive cyclonic windstorms, winters alternating from a condition so open as to freeze prematurely forced fruit and grain, and winters so stringently cold that the fruit trees are killed outright.

The even temperature and the rains every three or four days which we knew in childhood are things of the past. Summer in these days means to scorch for weeks at a stretch with unalleviated heat; and in the same state in which I was born, it has become necessary for the sons of the men who wasted the woods and the waters to put in overhead sprinkling systems in order to grow their garden vegetables while windmills and irrigation are becoming common.

In my childhood my father planted grain with the same certainty of having a full crop, that he had of having alternate day and night. To-day the farmer on my land has no more idea whether he will get a paying yield from the wheat, corn and potatoes that he puts into the ground than he has as to whether the next cyclone will blow his house into the lake or pass a few yards on the other side of it. We, as a nation, have already, in the most wanton and reckless waste the world has ever known, changed our climatic conditions and wasted a good part of our splendid heritage. The question now facing us is whether we shall do all that lies in our power to save comfortable living conditions for ourselves and the spots of natural beauty that remain for our children.

If this is to be done, a nation-wide movement must be begun immediately. Our climate could be greatly bettered if every man owning land would do what he can to restore original conditions by fighting to save the water in his vicinity, and by planting all the trees for which he can possibly spare space. **More water means more rain.** A heavier growth of timber breaks up culminative winds and gives bird life, under rigorous protection, a chance to renew itself. Wherever there are plenty of birds the spraying and fighting of insect pests is not necessary.

KING TUT'S TIMBERS

(From Pacific Coast Lumberman)

IN a recent article in the Timber Trades Journal, of London, Mr. Frank Tiffany writes of the wood in Tutankhamen's tomb. "Wood," he quotes, "if properly selected and manipulated, is almost imperishable and certainly more durable than stone."

The writer suggests that it would add enormously to the utilization and economy of wood if the identity of the species in the Luxor tomb could be determined.

In ancient writ cedars, fir and woods identical with sandalwood and cypress are mentioned. Again an examination of the methods of manufacture into the various articles of furniture and ornamentation found in the tomb would be instructive.

Publicity as a Forest Protector

By Robson Black,
Manager, Canadian Forestry Association.

Illustrations reproduced by courtesy of The Champion Coated Paper Co., New York

ORGANIZED propaganda for the promotion of a national forestry cause has obvious limitations but it also has quite definite usefulness. The term itself to many has a mischievous suggestion. Propaganda has been associated with so much prevarication and state-controlled blarney that many Anglo-Saxons are inclined nowadays to look upon all aggressive and specialized educational enterprises as selfish and sinister business. In spite of such evil reputation I submit that the cause of state forestry cannot make headway except through an intelligent partnership with public opinion. Further, the handicaps from which public forestry policies are now suffering throughout the Empire are not the outcome of public understanding and deliberate judgment, but of indifference, misunderstanding, prejudice, political side-stepping and other false and illogical attitudes which education can and does rapidly sweep aside. Our system of government is such that every policy involving large expenditures must have its origin with the masses of electors or await their sympathy and consent. The best evidence of the condition of state forestry when left to the devices of politicians, plus selfishly-interested exploiters, and without the check rein of popular opinion, may be found in more than one corner of the Empire where administration of the forests is being determined by transient considerations inherently inapplicable to forest management. The cry of 'cheap logs' still preoccupies our makers of laws and budgets with only here and there a counter-warning as to our mortgaged future. The political short-dated point of view suffices well enough for road building and mothers' pensions, and customs tariffs, but it plays havoc with the business of conserving forest wealth. New countries, such as Canada, just emerging from a reign of unchecked exploitation, with but little public experience in planning for the distant future or asserting state rights over the natural resources, have painfully to accommodate their thinking habits to the 'long time element' which is the peculiar and irritating characteristic of conservative forest administration.

After the Fire Demon Has Passed.

In Canada, the change from unbridled exploitation of public-owned forests to cautious scientific housekeeping is not a simple matter of government proclamation. It means a degree of interference with the practices of wood-using industries which have held for generations. It means higher lumber and pulp and paper prices for the 1924 and 1925 consumer in order to hold down the price for unborn Canadians in 1998. It means the diversion of millions of dollars of Government forest revenues, now applied to ordinary purposes of civil government, into a forest restoration fund to maintain the forest capital somewhere near par. Considering past practices in Canada, based upon "butchering without breeding" the job of establishing correct forest management means first of all that the Canadian people must take on the *state of mind* of Sustained Yield. Canada's history, in general, has been until recent years a repetition of "first come, first served," the law of the mining camp and lunch counter. The public, accustomed to think that history commences with each man's birth certificate, and that the British North America Act gave us the precious right to make all our own blunders in our own way, has been stuffed with exaggerations of the "inexhaustible forests," the "unscratched" resources. Optimism which has helped us over so many rocky roads, also created for us the fallacy that areas in the far north, unseen and unestimated, were probably brimming over with forest wealth. It is only within the last ten or fifteen years, since foresters got to work, that we decided it were far better to mark the unknown as "No Man's Land" for the final truth usually verifies the more dismal anticipation.

More than 80 per cent. of the habitable area of the Dominion of Canada is adapted only to timber production. By the wise provision of successive governments, eight out of ten acres of the forest estate are public-owned, even if many of the timber leases on such lands are virtually self-perpetuating and are certainly transferable. This fact of state-ownership of nearly all the forest lands gives to our governments ample power to enforce whatever conservation requirements the public interest may demand. Why, then, is the "public interest" so subservient to

the claims of exploitation? Why are the forests of Eastern Canada getting out-at-elbows, with even the corporations themselves advertising their fear of timber exhaustion in fifteen or twenty-five years?

One explanation is that probably not more than five per cent. of Canadian business men have given a assist in incorporating these things in the policies of governments and in securing monetary support. In a country such as Canada where the forestry point of view is of very recent creation, and where bids for political favour are founded upon promises of *immediate benefit* from all expenditure, it is not, perhaps, to be

Effects of Hurricane and Fire in a Heavy Stand

thought to the nation's forest resources, nor to their responsibility as citizens for forest perpetuation. Audiences of voters are at this late date amazed to learn that Canada is the legal and moral trustee of the timber estate and that forestry is *not* included in the training of a lumberjack. Bearing in mind, therefore, the inadequacy of the most elementary public knowledge of state responsibility for conserving forests, it is not surprising that a non-governmental, non-commercial body, the *Canadian Forestry Association* should have been called into existence. Its 13,000 members comprise lumbermen, forest engineers, pulp and paper company executives, editors, clergymen, farmers, and indeed almost every class of citizens. The aim is to identify forestry as a national cause and supply to the technical forester the element of public authority for which his profession stands so peculiarly in need.

Assuredly, propaganda that merely distributes elementary information to masses of people does not supply a code of forestry practice. It does not take the place of a national forest inventory or experimental plots or forest schools. It does, however, wondered at that forest research receives $30,000 from the Dominion Government as compared with $800,000 devoted to agricultural research. There are a hundred such anomalies calling for immediate correction. Is the forester to sit back and wait for the leisurely penetration of an essentially right idea? Most Canadian foresters believe in making use of a more positive and practical process. They hitch their wagon to the star of propaganda, for to wait for the recognition by busy legislators of a scientific idea merely because it is scientific, would be to wait until the cause of forestry is cheated out of forests.

The general idea behind the operations of the Canadian Forestry Association, purely a propagandist institution, is that a society that merely *stands* for a worthy ideal is likely to remain standing. Therefore, the annual programme has had very little to do with conventions of the converted and a great deal to do with the spread of common sense arguments for the prevention of forest fires and the application of the sustained yield principle to public management of publicly owned forest tracts. After all, Canada's besetting sin, as regards the natural resources, is the annual toleration of human-set timber fires. Last summer nearly five thousand were reported and millions of dollars worth of burning timber beclouded the skies for days. Nine-tenths of these fires were started by careless people, whether railway hands, settlers, campers, fishermen, river drivers, or others whom one might reasonably think should regard the forest as peculiarly their benefactor. To antidote public carelessness, to stimulate preventive legislation, to persuade magistrates to enforce the fire laws properly, these and like necessities call for a large staff and large expenditure, and the Canadian Forestry Association does not claim to have made more than a fair commencement. The membership has risen to 13,000, the annual revenues to $60,000 with about $13,000 additional contributed in services and materials.

It is possible that readers of the *Canadian Forestry Magazine* may be interested in some of these methods of propaganda developed by the Canadian Forestry Association. The power of the press in a country possessing 800 newspapers and magazines for a population of eight millions is self evident, and is of course the keystone of all forestry "campaigns." Happily, the larger papers such as the *Montreal Star* and *Gazette* and the *Toronto Globe* have given front rank to the question of timber depletion and such leadership in "news valuation" is contagious. Our Association has five space writers contributing fortnightly articles for distribution to the press, each man dealing with one section of the Dominion or with special economic angles of forest depletion. A weekly sheet arranged as "Questions and Answers," gets hundreds of columns of publicity because of the interlarding of forestry propaganda with items of admitted news value to all classes of readers. "The Editor's Scissors" is another device in the form of a galley proof of fifty word items keeping the public in touch with the work and aims of the forest services. To influence French-speaking settlers whose contact with timbered areas is one of the most fruitful causes of serious fires, a French-language newspaper, *L'Ami de la Forêt*, containing forest protection messages, instructions and news items, is prepared monthly and, with much commonplace entertainment thrown in, circulated to 50,000 homes in Northern Quebec and New Brunswick. The *Illustrated Canadian Forestry Magazine*, a more ambitious magazine of 68 pages monthly, is the Association's educational "flagship," reach-

ing 13,000 subscribers, including scores of educationists, public leaders, newspaper editors, and exerting undoubtedly a constructive influence.

May I detail briefly some of the other items from the past year's record of the Canadian Forestry Association. Five hundred and eighty-five public meetings were held by field officers of the Association to awaken interest in forestry and in prairie tree planting, with a total attendance of 130,000 persons, secured — it is well to emphasize — always in very small communities. The Forest Exhibits Car, a railway coach equipped with scores of models and designed to present the facts of the forestry cause in a graphic and plausible manner, travelled 12,000 miles and attracted in small towns, 215,000 people. Each evening the officers in charge of the car gave public lectures in local halls or in the open air, with an eighteen valve radio receiving set which will supply an additional feature in attracting crowds to the evening forest protection lectures. Another device is the Tree Planting Car, a railway coach, stripped of the usual seats and equipped as an auditorium with a sloping floor and electrical generators and motion pictures added. Devoted wholly to helping prairie province farmers to establish shelter belts as windbreaks about their homesteads, this unique enterprise covered more than 8,000 miles, and drew to the afternoon and evening meetings nearly 50,000 people. A great many municipalities were provided with special plans for establishing parks and beautifying school grounds, a service that may hardly be estimated until one has lived in a treeless, windswept prairie town, with its barren outlook and dust-laden air.

To band together the youth of Canada as intelligent partners in their forest properties, a Young Canadians Forest League was instituted in 1922, with an initial membership of 140,000 boys, with each of whom the League must keep in friendly communication, supplying constructive information, badges, contests, and other stimulating helps, for on the success of this new league our Association is building ambitious plans.

Some of the most magnificent forests in the world are to be found in the National Forests of the Pacific North west. Pictured above are Red Firs and Red Cedars of great beauty.

The making and circulating of motion pictures telling the story of forest fire prevention as only the "movies" can tell it to the masses, is another of our enterprises which with other schemes of special publicity may well be spared from detailed mention in this account.

One most fortunate and significant factor in the history of the Canadian Forestry Association is that the Government Forestry Services, private company foresters, the wood-using industries, and the general public (all well represented on the Board of Directors), maintain a close and thoroughly friendly contact and give generously of time and skill and substance to render the Association successful. This is a very happy condition indeed, for whatever progress the Association makes represents not the spurt of a band of powerless enthusiasts but a permanent forward movement of all the human factors responsible for the promotion of forestry in Canada.

Can I Plant Forest Trees for Profit?

A convincing demonstration that at high interest rates and with liberal provision for all costs, a planting project pays.

(Evidence from the Chief Forester of Pennsylvania)

THE one thousand farmers in Pennsylvania who will plant five million forest trees next spring give good reasons for doing this work. Some of them will plant the trees to meet the future need of wood on the farm; others, because they are convinced that a timber shortage threatens the prosperity of our industries and believe it is their duty to help prevent such a calamity. However, there are a large number of land owners who consider the returns of forest plantations as a satisfactory investment and will plant trees because of the returns, and not because of personal wood needs, of sentiment, or of a sense of public responsibility.

In Pennsylvania forest trees have not been planted long enough in plantations to grow to maturity. For this reason no examples of yields in Pennsylvnia can be cited. Records of plantation yields in the New England States are numerous and Pennsylvania conditions are equally good, if not better.

Let us assume that white pine seedlings will be planted and the planting stock furnished from the nurseries conducted by the Pennsylvania Department of Forestry at the cost of packing and transportation. The spacing should be 5 ft. x 5 ft. apart, which will require 1,800 trees per acre. The cost of establishing one acre of plantation will be approximately as follows:

Cost of packing at nursery and transportation (1,000 trees)	$1.39
Planting labor, 26 hours at 30c	7.80
Incidental	1.00
Total cost per acre of planted trees	$10.19

At Compound Interest

This amount placed at compound interest at 6 per cent. for 50 years, the time required for the trees to reach maturity, will amount to $187.70. The average annual expenses for taxes, protection, etc., should amount to not more than 40c. annually. At compound interest rate this will accumulate to $116.13. If, because of extreme conditions the taxes and protection costs should reach 65c. per acre per year, a very high cost, it will accumulate to $188.72 in fifty years. If this money ($10.19 for establishment and 40c. annual charges, were invested at compound interest at the legal rate for Pennsylvania it would amount to $303.83 at the end of fifty years. If 65c per acre were the annual charges it would amount to $376.42.

At the end of fifty years there should be on the acre 30,000 board feet of lumber, worth $20.00 per thousand stumpage, or a total of $600.00. In addition, the land will be available for another crop of timber. This yield is less than figures of actual cuts in the New England States, where 30,000 board feet per acre were grown in forty-six years, and as much as 41,000 per acre in sixty-one years. White pine of good quality is now worth $20.00 per thousand, and we may expect a higher price in fifty years when timber prices will undoubtedly be materially increased.

Tabulated Expenses and Receipts at 6 per cent. Interest

Annual Charge of 40c for Protection, Taxes, etc.

COSTS

Land $10.00 per acre with interest for fifty years	$184.20
Planting Costs $10.19	187.70
Annual Charge 40c. for fifty years	116.13
Total Costs	$488.03
Gain over 6 per cent	111.97
	$610.00

RECEIPTS

30M bd. ft. stumpage at $20.00	$600.00
Land	10.00
	$610.00

Annual Charge of 65c. for Protection, Taxes, etc.

COSTS

Land $10.00 per acre with interest for fifty years	$184.20
Planting Costs $10.19	187.70
Annual Charge 65c. for 50 years	188.72
Total Costs	$560.62
Gain over 6 per cent	49.38
	$610.00

RECEIPTS

30M bd. ft. stumpage at $20.00	$600.00
Land	10.00
	$610.00

Using these figures and considering an annual expense of 40c. per acre, the compound interest on the investment with land purchased at $10.00 per acre will amount to 6½ per cent. If $15.00 per acre were paid for the land the interest received on the investment would be approximately 6 per cent. If $20.00 per acre is paid, the interest will amount to 5½ per cent. plus, and if $30.00 per acre is the purchase price the interest will be about 5¼ per cent. If an annual expense of 65c per acre is used the investment will pay more than 6¼ per cent. interest when $10.00 per acre is paid for the land; 5 3-4 per cent. plus, when $15.00 is paid; 5½ per cent. when $20.00 is paid and 5 per cent. when $30.00 is paid.

This shows that white pine plantations even at present prices will bring in returns equal to the Pennsylvania legal rate of interest of 6 per cent. when the land is valued at $15.00 per acre, and higher than this rate with cheaper land. As a general rule, land valued at more than $40.00 can be more profitably used for agricultural or other purposes and should not be used for the growing of trees.

Fires have wrought much damage to the timberlands of Pennsylvania. It is also true that when a fire burns over a plantation most of the trees are killed. However, it is worthy of mention that the best available records show that a total of only 283 acres of plantations have been destroyed by fires during the past twenty-two years out of approximately 38,000 acres that have been set out with forest trees. This indicates that the fire risk is usually not great.

SIX MILLION TREES PLANTED

More than 6,200,000 forest trees were planted by private owners of forest land in Pennsylvania during the spring of 1923, according to an announcement made by Major R. Y. Stuart, the State's Chief Forester. This is the largest number of trees that have been planted on privately-owned forest land in any one year in the history of the State. This number of trees will reforest about 6,000 acres of land that would otherwise remain idle.

Sport, Rest and Recreation in Northern Ontario

Nine Hundred Miles of Wilderness is Now Readily Accessible

By J. Harry Smith

NOT only are lumbermen and industrial manufacturers and workers generally interested in the Government plans for reforestation and the steps already taken to ensure a supply of hard and soft woods for future generations but anglers and sportsmen throughout the Dominion are anxious to see that lands devastated by fire and cleared by the axe are re-clothed with trees. Though Canada retains her position as the best sporting country in the world, fire and axe have caused considerable depreciation in vast tracts in eastern and central North America so far as the sportsmen are concerned, and the sporting world is casting round for other fields where the finny denizens of lake, river and stream are able to multiply and grow to such a size that they are exceptionally worth while, and where game roams more or less unmolested out of season and is given a chance to increase.

Development of lands in the east and forest fires have destroyed many happy hunting grounds. When large areas are cut or burnt over, the water is no longer held back in the spring and after rains, with the result that at certain times, the rivers are flooded for short periods, and at others there is not sufficient water to harbor fish of any size. Streams that once were the breeding places of trout and other sporting fish run dry, and what fish do survive are often choked by sawdust and other small mill refuse, although in some provinces mill owners are forbidden to discharge sawdust into streams and rivers in which sporting fish spawn.

900 Miles of Wilderness

That great stretch of nearly nine hundred miles between Sudbury and the boundary line of Manitoba, north and south of the Canadian Pacific line, has of very recent years been "re-discovered" and is attracting each year more of the devotees of fishing and hunting who are looking for the "big stuff." In that country with a nine hundred mile front, there are only twelve points with a population of over 200. This means that there are practically nine hundred miles of virgin wilderness—nine hundred miles of fish and game.

Fishing on the Nipigon is as good as it is on the French River or Lake of the Woods, and that says much.

Some of the first posts of the Hudson Bay Company were established in this region, and that the company found it a profitable fur country is evidenced by the fact that very little news of it was allowed to creep into the outer world. Geological and railway surveyors in later years, having passed through the country, brought back tales of its richness, of how, for instance, Indians piled frozen trout like cordwood, in the Nipigon district, and how the "lunge" and bass were so plentiful as to cause men to tire of catching them.

Not long ago George Davis, of the United Fruit Company, New York, pulled a lunge out of the French river weighing 55 pounds. This beauty took over an hour and a quarter to land, and was afterwards weighed by several independent parties. From the Lake of the Woods district, Joe Calvert secured a lake trout weighing 45 pounds. The world's record speckled trout was taken from Nipigon waters in 1915 by Dr. J. W. Cook of Fort William, Ont. Weighing 14½ pounds, it measured 31½ inches from head to tail, and 11½ inches across. It was caught with rod and line baited with a live minnow.

Why has not this paradise of sportsmen been exploited more, this country of gorgeous views and exquisite panoramas been visited more, or this healthful district with its delightfully equable climate attracted more tourists and holiday makers? Nine hundred miles is a long stretch and whole armies of men could be, and are in fact absorbed by the country to the north and south. There are places never yet visited, delightful scenes which have not yet pleased the eye of man, streams abounding in fish which have never had a line cast over them. Those who have "gone in" have failed to leave their mark, and one of the greatest sporting districts on the continent is comparatively unknown.

Accommodation Available

Accommodation, or rather lack of it has been largely responsible for the fact that more people have not visited this Northern Ontario wilderness. Those who are content to camp under canvas, and suffer the attendant discomforts, have enjoyed their trips, but there are many who, being unable or unwilling to undergo the rigors of tent life have foregone any trip they may have desired to take on this account. These latter will read with pleasure that three bungalow camps, after the style of those so successfully operated along the line of the Canadian Pacific in the Canadian Rockies are in course of erection. They will be in operation about July 1st, in the most picturesque parts of the country and in great sporting districts. They will have the added advantage of being easily accessible from the railroad. One site is on the French River, another on Helen Lake, Nipigon, and the third at Kenora, Lake of the Woods.

The bungalow camps will serve as headquarters for fishing and hunting expeditions, and will be ideal places at which to spend a vacation, for they are so situated that those who do not desire to make long excursions into the woods may pass their time bathing, canoeing, or enjoying the hundred and one other pastimes usually found at holiday resorts. The tired housewife and business woman will find healing in the pine-fragrant breezes, and rest in the beautiful environs of the camps.

The French River Bungalow Camp is attractively located on an elevation which commands a magnificent view of the main channel of the French

The Nipigon River is the Gateway to hundreds of miles of fine Waterway for Canoeist and Fisherman

River, within 200 yards of the station. It is reasonably close to good fishing grounds, and besides fishing, French River affords some unexcelled canoe trips. The river is in reality a chain of small lakes connecting Lake Nipissing on the east with the Georgian Bay on the west, a distance of some sixty miles. From the new Bungalow Camp site once can reach French Village by canoe, nineteen miles with three portages, or can travel by launch at leisure fifteen miles east to Five Mile Rapids. By the latter means one can also cruise around Dry Pine Bay and west as far as Recollet Falls. By canoe one can radiate at will for unlimited distances. There is, for example, the fine trip along Dry Pine Bay, the Murdock River and a chain of small lakes to Wanup down the Wahnapitae River to Little Wahnapitae Lake, and thence to Ox lake, the confluence of the French and Pickerel Rivers.

Excellent trout fishing, highly attractive trips by launch and canoe, delightful bathing, fascinating Indian hieroglyphic paintings on the spectacular red rocks in the vicinity, are some of the many features of interest for visitors to the new Bungalow Camp at Nipigon. The ardent anglers who wish to try their luck on the forty mile stretch of rapids and pools of the Nipigon River can leave their families in camp while they follow trail and portage up north and then fish down stream—or perhaps the more adventurous sportsman would like to take the Steel River canoe trip of 175 miles through a primitive wilderness from Jack Fish to the headwaters of the Steel River and south again to Lake Superior, shooting many rapids and enjoying good fishing on the way.

The Lake of the Woods Bungalow Camp is in the vicinity of Devil's Gap, delightfully situated at a point on the mainland only twenty minutes from Kenora station by launch. This district is rather better known than the others and has already an established reputation among holiday makers. Aquatic sports, boating, sailing, and "exploring" are entered into with much enthusiasm each year and the numerous lakes tributary to Lake of the Woods are famous for their lake trout, salmon trout, large and small mouth bass, pickerel and "musky."

Young Canadians Forest League

Junior Branch of

CANADIAN FORESTRY ASSOCIATION

of which the Patron is

HIS EXCELLENCY, THE GOVERNOR GENERAL

An Invitation to the Boy Scouts of Canada

The Boy Scouts of Canada are invited to become members—**NO FEES**—of this League because its Cause is Forest Fire Prevention and the extension of Tree Planting.

The Adult organization—that is the Canadian Forestry Association which has a membership of over 12,000 public spirited citizens—has for the past twenty-two years been carrying on that work through educational channels and reaches daily 300,000 people. More than that number in the small rural centres have this year, visited its exhibit and instructional cars. The work has got to be extended and the adults ask the

Boy Scouts to Join Hands with Them

by joining the junior branch and wearing its badge. Remember there are **No Membership Fees.**

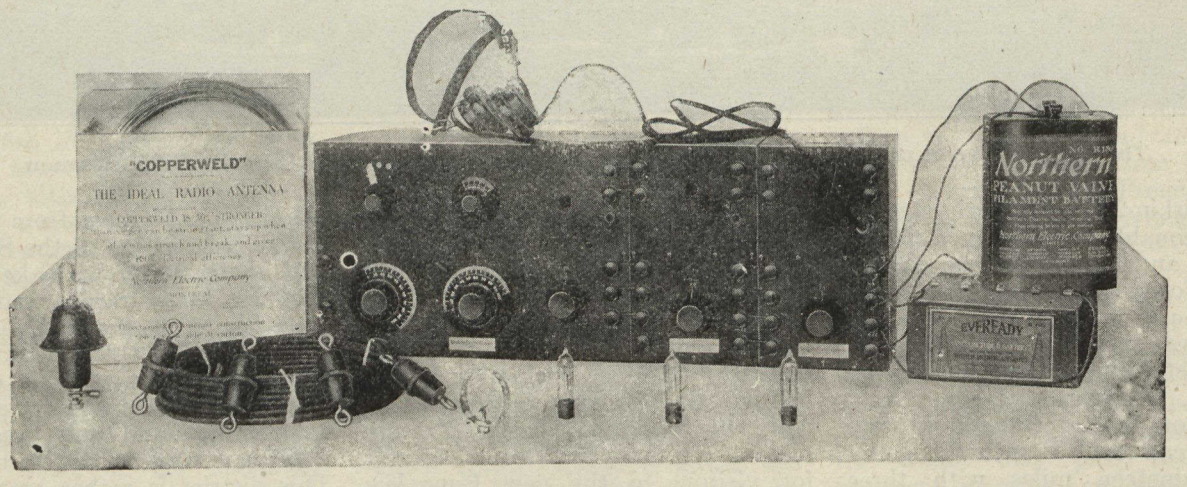
A Free Radio Set For Your Troop

Complete Outfit for Every Troop

To encourage and foster interest in Forest Protection and Tree Planting work in both adults and the Youth of Canada, the League offers to every Boy Scout Troop helping in this work, one of these excellent Radio Telephone Sets **FREE.** The presentation sets are made by the Northern Electric Co. and by the Marconi Wireless Telegraph Company of Canada Ltd., and under normal conditions have a range of from 700 to 1000 miles. They are equal in efficiency to the average $200.00 set, and come ready for immediate use.

The service the Boy Scouts are asked to perform in order to secure one of these Radio Sets is very light being chiefly the distribution of pamphlets.

THEY ARE NOT ASKED TO COLLECT MONEY

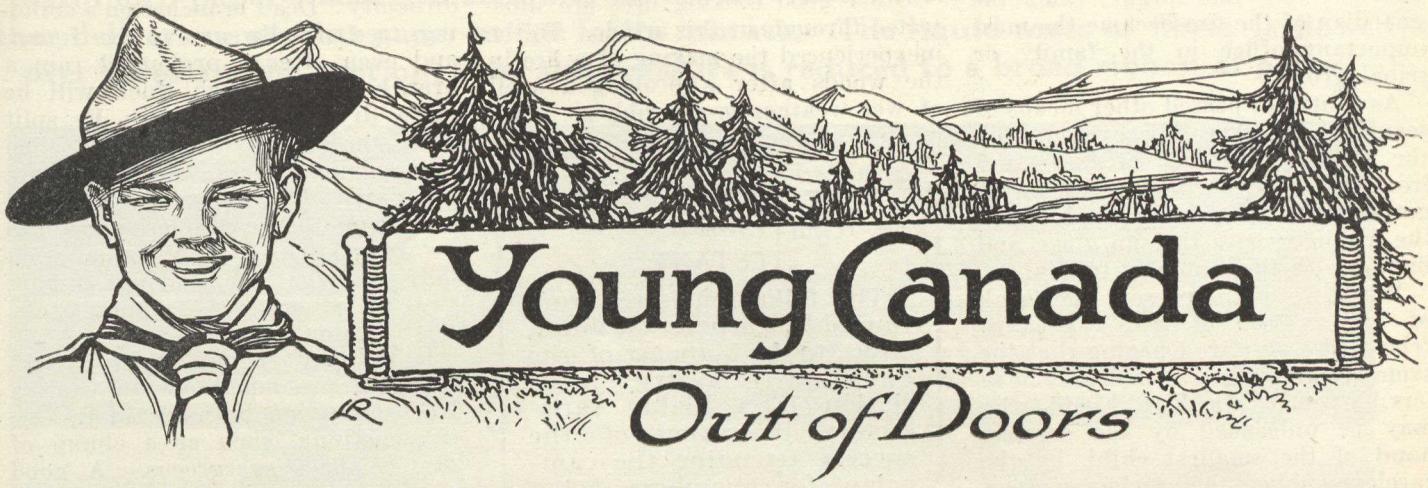


The complete outfit is as illustrated: Short Wave Tuner and Detector Unit: Two Amplification Units: Double Head Set, Complete Aerial System: Three Vacuum Tubes: Two Batteries.

SCOUTMASTERS AND SCOUTS ARE URGED TO WRITE AT ONCE FOR FURTHER PARTICULARS

COMMISSIONER, YOUNG CANADIANS FOREST LEAGUE

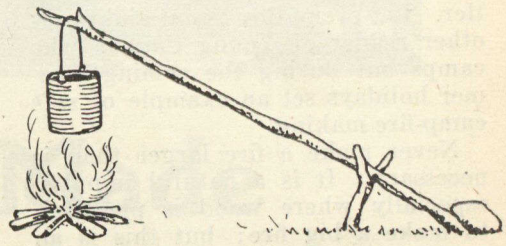
51 SPARKS STREET, OTTAWA



The Story of Fire

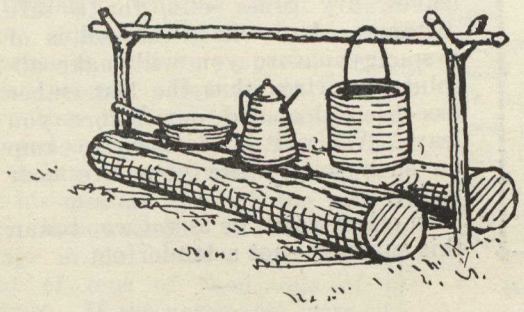
How man first discovered the uses of a flame and how this useful servant today may be best employed.

BY LOVELL COOMBS



IT probably will surprise many of our young readers to be told that fire was not always used by man; that it was "discovered," like the law of gravitation and other great principles or agents of nature.

Not only did man in the far dim past know nothing of the usefulness of fire, but he regarded it as one



of the great evil spirits, that from time to time struck down angrily from the sky, set the forests aflame, and sent himself and the wild animals fleeing for their lives. In those days man ate raw foods, much as did the animals. His home he made in the trees, in order to escape his prowling enemies at night.

While the first actual use of fire by man is not recorded, the following is one legend which seems plausible:

A bolt of lightning caused a forest fire in a section of what is now Southern Europe. Animals and human beings fled in terror. During the stampede, probably when the flight was beginning to slacken as a zone of comparative safety was reached, a bear turned upon a fleeing companion, a man.

Conquering a Bear

The man had observed that the bear was as fearful of fire as was he himself. Near at hand lay a burning branch. Momentarily in greater dread of the animal than the fire, the man caught up the ember and struck at the bear. The bear drew away and fled. For the first time man recognized fire as a possible friend.

He previously had noted that the forest fires burned longest where several trees had fallen together. As an experiment in protecting himself against other animals he now collected a number of branches and piled them upon the burning limb—to make what doubtless he called a "tree fire." To his delight he saw other passing animals swerve to avoid the fire.

Other fleeing men joined him, and assisted in the experiment. Night came, and instead of finding a still standing tree up which to climb for safety during the darkness, the group determined to make the great venture of remaining on the ground where they were under the protection of their new found friend, the fire.

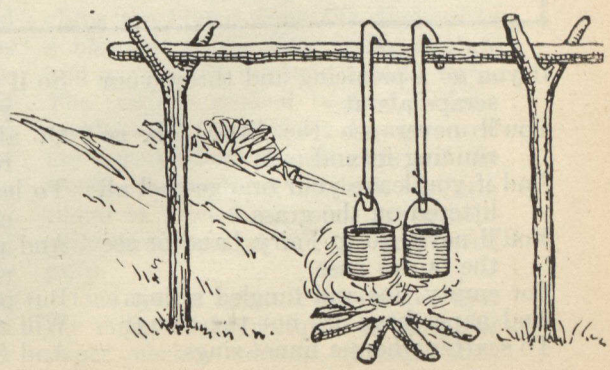
The fire did not play them false. Throughout the night their animal enemies made no attempt to molest them. More, as the night became cold, the crackling flames kept them delightfully warm. Another discovery! Often, previously, man had been miserably uncomfortable in his tree home; often he had viewed with envy the dry, comfortable caves in which certain of the larger animals lived.

Securing a Cave-Home.

Another idea came. Why not, with this new found friend, the fire, drive the bears out of that fine big cave in the hillside not far distant?

He determined to make the attempt. Burning embers were carried to the hill, and flung into the cave mouth. At once the bears came rushing frantically forth, and disappeared. With cries of joy the men took possession—and the age of the cave dwellers was begun.

Of course the fire was zealously



guarded day and night; and the guardian of the fire became the most important office in the family or tribal group.

As centuries passed other means of securing fire were discovered — by the striking together of flints and iron, by rapidly rubbing sticks together, with the whirling spindle of the fire bow, with the sun glass, and finally with the match of to-day.

While we of the present age think of fire as one of man's greatest friends, we also are learning that the same fire may too easily become a terrible enemy, a Fire Fiend who may be unleashed by the careless hand of the smallest child, by the careless smoker, the careless camper, or by the careless land-clearing settler. Let every Boy Scout and every other reader of Young Canada who camps out during the coming summer holidays set an example of safe camp-fire making.

Never make a fire larger than is necessary. It is a natural impulse, especially where wood is plentiful, to make a big fire; but this is an impulse that no real woodsman will give in to. Be a real woodsman.

As a matter of fact you will find it interesting to discover how small a fire you can use for your out-door cooking.

Building a Camp Fire.

One of the best camp fireplaces, both for economy of fuel, and for convenience of cooking, is the small fireplaces made of square-faced stones. These should be placed six to eight inches apart, and laid in direction a little off the prevaling wind. This is to prevent the wind driving the heat through. The length of the fireplace can be adjusted to the cooking needs of the party. A fireplace two feet long will easily take care of the cooking for a party of eight.

Other good cooking fires are illustrated throughout this article. To the inexperienced the making of a fire in the woods after a prolonged spell of wet weather is a problem. As a matter of fact it offers no serious difficulty. Dead branches on a standing tree usually are to be found, and even after a prolonged rain a branch half an inch thick will be quite dry inside. It can be split down the middle with a knife, then into smaller pieces; or better yet, the damp outside can be whittled away and the remainder made into a "fuzz stick." That is, a stick shaved so that the shavings remain attached at one end, forming a circular cluster.

If unlucky enough to be caught out in a prolonged driving rain a fire usually can be made in the lee of something, such as a clump of low, compact evergreens. A good solution is a cedar, spruce, or fir, with lower branches four or five feet above the ground; or whose lower branches are dead, and thus may be cut out, incidentally to be used as fuel. First shake the tree thoroughly, to get the water down, then make your fire under its cover. You will have it well under way before the tree has again become waterlogged.

However soaked one may be, there can always be found something on which a match may be struck: the dry inside of a smoothly split dead branch, or the inside of your leather belt, or a small smooth stone, washed clean, and with the moisture flicked off.

Chose Good Location

Of course you will make sure that you choose a fire location from which the fire cannot spread, if necessary scraping away or burning back leaves, dry grass, etc., for a safe distance. And where the soil is of a spongy nature you will make absolutely certain that the last ember has been drowned out before you leave. Where it is necessary to camp on such soil, locate your fire near water.

In other words be a real woodsman this summer—not a tenderfoot.

A SATISFIED CONTESTANT

The following letter from Harold V. Corbett, Cardnuff, Sask., to the Manager of the Canadian Forestry Association is a highly satisfactory indication of the success attending the campaign for members being conducted by the Young Canadians Forest League:—

"Just a line or two to see how things are going. I have my radio set installed now. I built two more units and installed every bit myself. I asked the Marconi people what range could I get in the summer? They wrote and answered my question with 500 miles. I wrote them this morning with a surprise letter. I have received over eight stations 1,200 miles from Carnduff and two over 2,000 miles. Now that's hitting the high spots eh? How are the other boys coming along in the contest? Get some of them to write me and I'll tell them how easy it was and encourage them. I'll answer all letters. You said I would get at least twelve from Carnduff, my total number now is twenty-two broad-casting stations."

PIC-NICS AND LITTER

Reproduced from "Punch"

If you go a-picnicing and throw your scraps about
You'll never see the little folk go running in and out;
And if you leave your orange-peel all littered on the grass
You'll never go to Fairy Land or see the fairies pass.
For empty tins and tangled strings
And paper bags are not the things
To scatter where a linnet sings.

So if you go a-picnicing, remember you're a guest
Of all the tiny people, and you'll really find it best
To leave their ball-room tidy and to clear away the mess—
And perhaps you'll see a fairy in her newest dancing dress.
But paper bags and broken combs
Will really wreck the pixie homes,
And frighten all the tiny gnomes.

But if you go a-picnicing and you are Elfin wise
You'll maybe hear with fairy ears and see with goblin eyes.
The little Folk will welcome you and they will open wide
The hidden doors of Fairy Land and you will pass inside,
And maybe see a baby fay
White-cradled in a cherry spray
Although it is Bank Holiday.

A mammoth paper-making machine which at one end receives liquid pulp and at the other delivers newsprint paper at 600 feet a minute. The liquid mass of fibres is flowed over wires and by suction, heat and pressure is reduced to a broad ribbon of paper.

How Paper Is Made

(With acknowledgement to J. Newell Stephenson)

THE sheet on which this article has been printed was, just a few months ago, folded up in the fibres of a spruce tree growing in some corner of Northwestern Ontario. Indeed almost everything we do in Canada has a starting point in the growing forest, whether agriculture, coal mining, fisheries, etc., but the making of a sheet of paper, particularly what is called 'newsprint' paper for the daily and weekly press, is, in a very special way, a forest process. Few of us realize how the modern newspaper has changed our methods of life, or how the ability of an advertiser to broadcast his message through the printed page, has wrought an unbelievable change in the location and management of tens of thousands of industries. If the newspaper were suddenly taken away from us civilization would be thrown into chaos.

An Avalanche of Paper.

The presses of the United States and Canada each week-day run off over 30,000,000 copies of newspapers. One New York Sunday paper requires the spruce and balsam fir crop on over 50 acres of Canadian woodland for a single edition. It has been roughly estimated that the Canadian newspaper of largest circulation will devour, in a day's run, from 220 to 250 average-size trees. It is not difficult to understand, therefore, that to meet the demand each day for 40,000,000 newspapers the forest storehouse must be enormous in area, and well stocked.

When the logs arrive at the mill, either by floating down the river or hauled by rail, they are sawed into blocks from two to four feet long and the bark is removed by tumbling the blocks in huge barrels made of steel angle iron. The violence of the tumbling completely cleans away all signs of bark and the wood comes rolling out all white and clean and ready for the first process. Part of the barked blocks go to the groundwood mill and the rest to the sulphite mill. The finished product, newsprint paper, you see, contains about 80% of ground-wood pulp and 20% of sulphite pulp.

Making Pulp on a Grindstone.

In the groundwood mill the blocks are held by hydraulic pressure flat against a revolving grindstone, and the fibres are rubbed off. Everything that was in the wood — and often other things besides, remains in the pulp. The pulp from the grinders is mixed with water and forced through strainers to remove big slivers, knots, etc., and most of the water is then removed to make less material to handle. In some plants the thick pulp is pumped directly to huge storage tanks in the paper mill or further dewatered and formed into sheets which are folded into bundles or "laps" containing about 35% fibre.

How Wood is Cooked.

The first operation in the sulphite mill is to chip the blocks into small pieces to facilitate the penetration of the cooking liquor. The liquor is prepared by burning sulphur and dissolving gas in lime water or in water which is trickling over limestone in a tower. The solution is "bi-sulphite of calcium," hence the name "sulphite" for this kind of pulp.

The chips and cooking liquor are fed into huge boilers or digesters. The cooking is done by steam for about eight to ten hours. By this process about one-half the solid matter in the wood is removed, leaving only the comparatively pure cellulose fibre. A cord of wood yields approximately one-half ton of sulphite pulp, while the same cord would yield about a ton of groundwood pulp.

When the cooking is complete the chips are blown from the digester to a blow-pit where they strike a plate and are broken down to a pulp form. The pulp is washed to free it from residues of the cooking liquor, and the non-cellulose constituents of the wood. After being washed, the processes of thickening, etc., are practically the same as for ground wood pulp.

One would hesitate to believe that the milky-looking liquid pasisng the paper machine screens, through slats only ten thousandths of an inch wide,

could possibly be formed into a product which could be used for printing the daily news or for wrapping a parcel. Yet such is the perfection of the paper machine and the skill of the paper maker that this wonderful result can be accomplished with individual fibres averaging only an eighth of an inch, or less, in length.

In the most modern mills, where the production is kept high and manufacturing costs low, the pulps are simply run from the "slush" storage, in the proper proportions, into large mixing tanks, from which it goes to the paper machines. Many mills still use the original mixer, the beater, and necessarily so where the pulp is handled in laps. In the beater the fibres are brushed and rubbed between a revolving roll and a stationary plate, a process which, besides mixing the fibres, improves their papermaking quality.

The mixed pulps or "stuff" is run into storage tanks, called stuff chests, in the machine room and pumped to a regulator which allows just the right amount to flow continually to the paper machine, the excess going back to the chest. Before the "stuff" reaches the machine it is again strained or "screened," to make sure the fibres are of uniform size, and extra water is added to get the proper inter-weaving of the fibres as the sheet of paper is formed.

A glance now at the picture of a paper machine will give the reader an idea of the nature of the apparatus and the order of events. The machine used for making newsprint, book, wrapping and writing papers is called the Fourdrinier, from the name of the two brothers who bought up and developed the original patent of Louis Robert, whose invention dates from 1799, only 120 years ago. In that time wonderful improvements have been made, modern machines making a sheet of paper 15 feet wide at the rate of 650 feet or more per minute. Some machines run more than 800 per minute, and the paper is carried automatically from one end to the other.

The wire part of the paper machine is the most important and the wire cloth is the most expensive item of supply, costing as much as $800 of $900 for 160" machines, and lasting from three days to three weeks.

As the stuff flows out on the endless wire it contains about one part of fibre and 200 parts of water. It flows out on the moving wire at nearly the same rate as the latter travels. No sooner does the fluid spread out on the wire than the water starts to go through. Before this has proceeded very far, however, the fibres, in settling, have had a chance to inter-weave. The fabric is not of uniform strength in both directions, because the fibres have a tendency to lie in the direction the stream is flowing, therefore the paper is weaker across the machine than parallel to the direction of flow. Hence the paper tears more easily one way than the other. In slower running machines it is possible to make a paper of nearly the same strength in both directions.

Due to the speed of the machine and the limited length of the wire, only a portion of the water can drain through. An additional amount is drawn out by suction, applied through suction boxes with perforated tops, over which the wire travels. Before leaving the wire the paper passes between a pair of rollers, called "couch rolls," which press the fibres together and squeeze out more water. In some machines, a suction roll is used at this point. It is this roll or the lower one of the pair, which drives the wire.

The paper is now made, so far as the inter-weaving of the fibres is concerned, and it contains about 90 per cent. of moisture. In order to improve the firmness, texture and to remove more water, the sheet is passed through several pairs of "press" rolls, carried by fine woollen belts.

Most of the water is removed by evaporation, the paper passing over steam-heated drums called "dryers." This, of course, is expensive, so as much water as possible is removed by mechanical means, although the best than can be accomplished is to deliver a sheet about 35% dry to the dryers. As the finished paper will contain from seven to ten per cent. of moisture, nearly two tons of water must be evaporated.

Smoothing the Surface.

The finishing, or smoothing of the surface, is done by the part of the machine called the calender, a stack of nine to thirteen special steel rolls. The friction and weight of the rolls on the paper as it winds down through the stack really "irons" out the roughness, presses down the frizzy fibres and gives a surface flat enough to take the ink properly from type and cuts in the press room. The endless sheet is then wound on reels and from these, in turn, is passed through a set of rotary shears that divide it into strips of the proper width, and these strips are wound on cores in rolls of the correct width and diameter, for the newspaper presses. Any breaks are carefully joined and a "flag" or signal is placed in the roll at that point to warn the pressman of some defect in the roll. Wrapping the roll is comparatively simple, yet this and the loading into the cars must be conscientiously and carefully done if the paper is to arrive in good condition.

Some newspapers require paper in sheets. To accommodate them the mill must have another department, where the paper from the rolls is passed through a cutter, whose revolving knife cuts the strip into pieces the desired length. The sheets are then counted by reams and packed in bundles.

For special effects an extra high finish is sometimes required. To get this the strips are passed through the super-calender, a calender stack made up of alternate rolls of steel and compressed paper or cotton. A very high luster can thus be obtained, the paper often going through several times. The product is called "super-news" and is largely used for pictorial sections of the paper.

When it is necessary to produce a special color or some other effect requiring a fundamental treatment of the stock, the necessary materials, color, sizing, clay, etc., are added in the mixer or the beater.

For other grades of paper, the operation of paper machine is practically the same as described, but such papers usually require special additional processes for the preparation of the raw material and the finishing of the paper. The selection of stock is of greatest importance, and more care is required at most points in the process.

THE CAMPERS INDICTED!

How many forest fires are started by campers?

Recently the Chief Forester of British Columbia made the following statement:-

"The fire losses of the Season 1922, so far as concerns the destruction of timber, amounts to 730 million feet valued at one-and-a half million dollars, while other forms of property destroyed including farm buildings, logging equipment, etc., amounted to $693,916. Out of a total of 2,591 fires, the greatest single cause of starting such fires is that listed as Campers and Travellers, who were known to be responsible for 625 or 24.2 per cent. There is little doubt that a number of the fires which started from 'unknown causes' amounting to 536 can be attributed to campers and travellers; so that it is fairly safe to say that 25 per cent, of all the fires caused in British Columbia last year were caused by the carelessness of people who should have the greatest interest in keeping the forests green.

A Dramatic Flagging

The Young Telegraphers Series

By LOVELL COOMBS

Illustration by F. B. Master

SINCE shortly following Jack Orr's appointment to Midway Junction Alex had been "agitating", as he called Alex had been "agitating," as he called it, for his friend's transfer to the telegraph force at the division terminal. At length, early in the fall, Alex's efforts bore fruit, and Jack was offered, and accepted, the "night trick" at one of the big yard towers at Exeter.

Of course the two chums were now always together. And the day of the big flood that October was no exception to the rule. All afternoon the two boys had wandered up and down the swollen river, watching the brown whirling waters, almost bank high, and the trees, fences, even occasional farm buildings, which swept by from above. When six o'clock came they reluctantly left it for supper, and the night's duties.

"Well, what do you think of the river, Ward?" inquired the chief night despatcher as Alex entered the despatching room.

"It looks rather bad, sir, doesn't it. Do you think the bridge is quite safe?"

"Quite. It has been through several worse floods than this. It's as strong as the hills," the despatcher affirmed.

Despite the chief's confidence, however, when about 5 o'clock in the morning there came reports of a second cloudburst up the river, he requested Alex to call up Jack, at the yard tower which overlooked the bridge, and ask him to keep them posted.

"Tell him the crest of this new flood will likely reach us in half an hour," he added; "and that by that time, as it is turning colder, there'll probably be a heavy fog on the river."

Twenty-five minutes later Jack suddenly called, and announced, "The new flood's coming! There is a heavy mist, and I can't see, but I can hear it. Can you see it from up there?"

Alex and the chief despatcher moved to one of the western windows, raised it, and in the first gray light of dawn gazed out across the valley below. Instead of the dark waters of the river, and the yellow embankment of the railroad following it, winding away north was a broad blanket of fog, stretching from shore to shore. But distinctly to their ears came a rumble as of thunder.

"It must be a veritable Niagara," remarked the chief with some uneasiness. "I never heard a bore come down like that before."

"Here she comes," clicked Jack from the tower. They stepped back to his instruments.

"Say!—"

There was a pause, while the chief and Alex exchanged glances of apprehension, then came quickly, "Something has struck one of the western spans of the bridge and carried it clean away—

"No—No, it's there yet! But it's all smashed to pieces! Only the upper structure seems to be holding!"

Sharply the despatcher turned to an operator at one of the other wires. "McLaren, Forty-six hasn't passed Norfolk?"

"Yes, sir. Five minutes ago."

A cry broke from the chief, and he ran back to the window. Alex followed, and found him as pale as death.

"What's the matter, Mr. Allen?" he exclaimed.

"Matter! Why, Norfolk is the last stop between that train and the bridge! She'll be down here in twenty minutes! And even if we can get someone across the bridge immediately, how can they flag her in that wall of mist?" Hopelessly he pointed where on the farther shore the tracks were completely hidden in the blanket of white vapor. "And there's no time to send down torpedoes."

At the thought of the train rushing upon the broken span, and plunging from sight in the whirling flood below, Alex felt the blood draw back from his own face.

"But we will try something! We must try something!" he cried.

At that moment the office door opened and Division Superintendent Cameron appeared. "Good morning, boys," he said genially. "I'm quite an early bird this morning, eh? Came down to meet the wife and children. They're getting in from vacation by Forty-Six.

"Why, Allen, what is the matter?"

Worked his way forward from tie to tie.

The chief swayed back against the window-ledge. "One of the bridge spans —has just gone," he responded thickly, "and Forty-Six—passed Norfolk!"

The superintendent stared blankly a moment, started forward, then staggered back into a chair. But in another instant he was on his feet, pallid, but cool. "Well, what are you doing to stop her?" he demanded sharply.

The chief pulled himself together. "It only happened this moment, sir. The man at the yard tower just reported. One of the western spans was struck by something. Only the upper structure is hanging," he says.

"Can't you send someone over on foot, with a flag, or torpedoes?"

"There no torpedoes at the bridge house, and there's not time to send them down. As to flagging—look at the mist over the whole volley bottom," said the despatcher pointing. "Except directly opposite, where the wind between the hills breaks it up at times, the engineer couldn't see three feet ahead of him."

The superintendent gripped his hands convulsively. Suddenly he turned to Alex. "Ward, can't you suggest something?" he appealed. "You have always shown resource in emergencies."

"I have been trying to think of something, sir. But, as the chief says, even if we could get a man across the bridge, what could he do? I was down by the river yesterday morning, and the haze was like a blind wall."

"Couldn't a fire be built on the tracks?"

"Not quickly enough, sir. Everything is soaking wet."

The superintendent strode up and down helplessly. "And of course it had to happen after the Riverside Park station had closed for the season," he said bitterly. "If he had had an operator there we—"

The interruption was a cry from Alex. "I've something! Oil!"

He dashed for the tower wire.

"What? What's that?" cried the superintendent running after.

"Oil on a pile of ties, or anything, sir —providing Orr can get over the bridge," Alex explained hurriedly as he whirled off the letters of Jack's call. The official dropped into the chair beside him.

"I, I, TR," answered Jack.

"OR, have you any oil in the tower?" shot Alex.

"No, but there's some in the lamp-shed just below."

"Look here, could you possibly get across the bridge?"

"I might manage it. There is a rail bicycle in the lamp-house. If the rails are hanging together perhaps I could shoot over with that. Why?"

"Forty-Six is due in twenty minutes, and apparently we have no way of stopping her except through you."

"Why, certainly, I'll risk it," buzzed the sounder. "I suppose the oil is to make a quick blaze, to flag her?" Jack added, catching Alex's idea.

"That's it. Make it just this side of the Riverside Park station."

"OK! Here goes!"

"Good luck," sent Alex, with a sudden catch in his throat, as he realized the danger his chum was so cheerfully running. "God help him!" added the superintendent fervently.

Jack, in the distant tower, took little time to think of the danger himself. Catching up a lantern and lighting it, he was quickly out and down the tower steps, and running for the nearby shed. Fortunately it was unlocked. Darting in, he found a large can of oil. Carrying it out to the main-line track, he returned, and hurriedly dragged forth the yard lamp-man's rail bicycle—a three-wheeled affair, with the seat and gear of an ordinary bicycle.

Swinging the little car on to the rails, he placed the oil can on the platform between the arms, swung the lantern over the handle-bars, mounted, and was off pedalling with all his might.

As he speedily neared the down-grade of the bridge approach,, and the roar of the flood met him in full force, Jack for the first time began to realize the danger of his mission. But with grimly set lips, he refused to think of it, and pedalled ahead determinedly.

He topped the grade, and below him was a solid roof of mist, only the bridge towers showing.

Apprehensively, but without hesitation, he sped downward. The first dampness of the vapor struck him. The next moment he was lost in a blinding wall of white. He could not see the rails.

On he pedalled with bowed head. Suddenly came a roar beneath him. He was over the water.

Jack's occasional views from the tower had shown him where the bridge was shattered; and for some distance he continued ahead at a good speed. Then judging he was nearing the wrecked portion, he slowed down and went on very slowly, peering before him with straining eyes, and listening sharply for a note in the tumult of water below which might tell of the broken timbers and twisted iron.

It came a roar of swirling, choking and

With the sharp words he again grasped the key.

gurgling. Simultaneously there was a trembling of the rails beneath him.

He was on the shattered span.

At a crawl Jack proceeded. The vibration became more violent. On one side the track began to dip. Momentarily Jack hesitated, and paused. At once came a picture of the train rushing toward him, and conquering his fear, he went on.

Suddenly the track swayed violently, then dipped sharply sideways. With a cry Jack sprang off backwards, and threw himself flat on his face on the sleepers. Trembling, deafened by the roar of the cataract just beneath him, he lay afraid to move, believing the swaying structure would give way every instant. But finally the rails steadied, and partly righted; and regaining his courage, Jack rose to his knees, and began working his way forward from tie to tie, pushing the bicycle ahead of him.

Presently the rails became steadier. Cautiously he climbed back into the saddle, and slowly at first, then with quickly increasing speed and rising hope, pushed on. The vibration decreased, the track again became even and firm. Suddenly at last the thunder of the river passed from below him, and he was safely across.

A few yards from the bridge, and still in the mist, Jack peered down to see that the oil can was safe. He caught his breath. Reaching out, he felt about the little platform with his foot.

Yes; it was gone! The tipping of the car had sent it into the river.

As the significance of its loss burst upon him, and he thought of the peril he had come through to no purpose, Jack sat upright in the saddle, and the tears welled his eyes.

Promptly, however, came remembrance of the Riverside Park station, a mile ahead of him. Perhaps there was oil there!

Clenching his teeth, and bending low over the handle-bars, Jack shot on, determined to fight it out to the finish.

Meantime, at the main office, the entire staff, including the superintendent, the chief despatcher and Alex, were crowded in the western windows, watching, waiting and listening. Shortly after Alex had announced Jack's departure a suppressed shout had greeted the tiny light of his lantern on the bridge approach, and a subdued cheer of good luck had followed him as he had disappeared into the wall of mist.

Then had succeeded a painful silence, while all eyes were fixed anxiously on the spot opposite where a light west wind, blowing down through a cut in the hills, occasionally lifted the blanket of fog and dimly disclosed the river bank and track.

Minute after minute passed, however, and Jack did not reappear. The silence became ominous.

"Surely he should be over by this time, and we should have had a glimpse of his light," said the chief. "Unless—"

An electrifying cry of "There he is!" interrupted him, and all momentarily saw a tiny, twinkling light, and a small dark figure shooting along the distant track.

A moment after the buzz of excited hope as suddenly died. From the north came a long, low-pitched "Too—oo, too—oo oo oo!"

The train!

"How far up, Allen?"

"Three miles."

The superintendent groaned. "He'll never do it! He'll never do it! She'll be at the bridge in five minutes!"

"No; Broad is careful," declared the chief, referring to the engineer of the coming train. "He won't keep up that speed when he strikes the worst of the fog. There are eight or ten minutes yet."

Again came the long, mellow notes of the big engine, whistling a crossing.

"Who's that?" said Alex suddenly, half turning from the window. The next moment with a cry of "He's at the station! Orr's at the Park station!" he darted to the calling instruments, and shot back an answer. The rest rushed after, and crowded about him.

"I'm at the Park station," whirled the sounder. "I broke in. I lost the oil can on the bridge. There is no oil here. What shall I do?"

As the chief read off the excited words to the superintendent, the official sank limply and hopelessly into a chair.

"But might there not be some there, somewhere? Who would know, Mr. Allen?"

At Alex's words the chief spun about. "McLaren, call Flanagan on the 'phone!" he cried. "Quick!"

The operator sprang to the telephone, and in intense silence the party waited.

He got the number.

"Hello! Is Flanagan there?"

"Say, is there any oil across the river at the Park station?

"For Heavens sake, don't ask questions! Is there?"

"Yes; he says there's a half barrel in the shed behind," reported the operator.

Alex's hand shot back to the key.

At the first dot he paused.

Through the open window came a whistle, strong and clear.

The chief threw up his hands. Alex himself sank back in his chair, helplessly.

Suddenly he again started forward.

"I have it!"

With the sharp words he again grasped the key, and while those about him listened with bated breath he sent like a flash, "Jack, there's a barrel of oil in the shed at the rear. Knock the head in, spill it, and set a match to it.

"**Burn the station!**"

The chief and the operators gasped, then with one accord set up a shout and darted back for the windows. The superintendent, told of the message, rushed after.

In absolute silence all fixed their eyes on the spot a mile up the river where lay the little summer depot.

Once more came the long-drawn "Too—oo, oo, oo!" for a crossing.

"The next 'll tell," said the chief tensely — "for the crossing this side of the station, or—"

It came. It was the crossing.

But the next instant from the mist shot up a lurid flare. From the windows rose a cry. Higher leaped the flames. And suddenly across the quiet morning air came a long series of quick sharp toots. Again they came — then the short, sharp notes for brakes.

And the boys and the flames had won!

The superintendent turned and held out his hand. "Ward, thank you," he said huskily. "Thank you. You are a genuine railroader."

"And — about the station?" queried Alex, a sudden apprehension in his face and voice. For the moment the crisis was past he had realized with dismay that he had issued the unprecedented order for the burning of the station entirely on his own responsibility.

"The station?" The superintendent laughed. "My boy, that was the best part of it. That was the generalship of it. There was no time to ask, only act. The fraction of a second might have lost the train.

"No; that is just why I say you are a genuine railroader — the burning of the station was a piece of the finest kind of railroading!

"And this reminds me," added the superintendent some minutes later, leading Alex aside and speaking in a lower voice. "We expect to start construction on the Yellow Creek branch in six weeks, and will be wanting an 'advance guard' of three or four heady, resourceful operators with the construction train, or on ahead. Would you like to go? And your friend Orr? There'll be plenty of excitement before we are through."

"I'd like nothing better, sir, or Orr either, I know," declared Alex with immediate interest.

(Continued from page 430)

tervals the creature rent the air with this cry, followed by the wail of utterly hopeless despair. Each scream echoed off in the woods about one hundred yards away, but the moan faded away in the moonlight and became a mere wraith of sound. I could not help visualizing it and see it mount upward toward the moon and become fairly blue and transparent in the beams. No human voice could give the scream or imitate the hopelessness of despair. The only sound I ever heard that was at all like the cry was uttered by a young man I caught one night stealing grapes. I suddenly rose up, draped in black, and seized him by the leg as he was trying, half paralyzed with fear, to get over the wall. He gave forth a wild, desperate animal scream as if he had found himself in the clutches of a veritable black fiend. Only the wild animal which slumbers in each of us and which fear can at times so suddenly awaken, was vocal in that cry, and as for the utterly forlorn and heart breaking crescendo of the midnight wail, I have never heard anything approaching it from man or beast".

The summer home of the lynx is usually in a hollow log or stump, located in a heavy thicket where the female gives birth to two young. The young stay in this home until they are large enough to follow mother around. The kittens are very pretty and cute and very much resemble our domestic cats. If taken when quite young they are easily tamed. They also live in the mountains, canyons, plains and deserts. Their range in North America is from the Southerly part of the Yukon territory to as far south as Pennsylvania.

Some Hints for Junior Woodsmen

If you are carrying firearms, be sure and unload them before you come into camp.

Take a few yards of mosquito netting with you. It takes up little room and means comfort at times.

A well soaked cloth wrapped around a bottle will keep it cool. Hang it up in a breeze in the shade.

Keep all of your extra matches in a large bottle.

Signal of distress. Three shots: fire once, wait five seconds, and fire again twice.

Remember it is warmer to sleep in a snow drift than on the bare ground.

To keep ants away from rations set a box on four sticks standing in tin cans or saucers full of water and the ants can't get to them.

Talk to your dog or horse, — he is just as lonely as you are.

Always take the natives advice as to living conditions and avoid sickness. They have learnt by experience and experience may be costly to you.

If your boots are wet, scrape away some hot dirt or sand from under the fire and fill them with it. They will be dry in the morning.

To avoid sore feet, wear large shoes with small hob nails that cannot be felt through the soles. A thin pair of socks soaped on the heal on the inside next to the feet, and a heavy pair of woolen socks over them. This will positively prevent blisters.

If you fall in the water, no matter how cold the weather, take off all your clothing and wring it out as dry as possible and put it on again. You will be warmer afterwards and avoid colds or worse.

Do all you can to preserve the forests of Canada; they belong to you, have done good service in the past and the future depends on the treatment they are going to get at present.

Never toss away burning matches or cigarettes. Warn anyone with you of the great danger of lighted matches or tobacco in a forest area.

Never start a fire in the forest among leaves, dry wood, against a log or against any tree whether it be dead or alive.

Never start a fire in the moss or peat of a dry bog. It may smoulder for days and at last develop into a great calamity.

Try to build your camp fire on a rocky shore, or else scrape away the top soil until you reach earth or gravel.

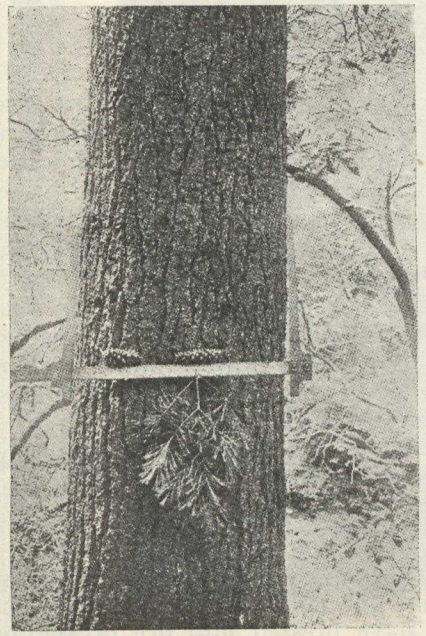
Never leave camp without putting your fire out. Be sure that it's "DEAD OUT" by a liberal use of water or earth.

If you catch sight of a fire started from any cause and it's too far gone to do anything yourself, notify the nearest ranger, station agent, or any public official with all haste possible.

How to Know the Pines

A Five-minute Talk on the White, Red and Jack Pine—How to tell Them Apart—Uses We Make of Them.

By B. R. Morton, Ottawa.



WHITE PINE BARK

On young trunks it is greenish brown in color and quite smooth. Later it becomes greyish brown and is roughened by shallow broad ridges.

THE white pine (Pinus strobus) is one of our most beautiful evergreens. It is the tallest and most stately tree in our eastern forests. Where it has a chance to develop under favorable conditions it frequently attains a height of 150 feet and more and a diameter of 3 to 5 feet. When young, it has a rather symmetrical, conical form sending out its branches at right angles to the trunk in more or less regular whorls of five. This regular branching is not so apparent in older trees especially when they have been growing in dense stands. The lower branches are then usually dead and have dropped off leaving a long clear trunk with a rather flattened top.

How to Tell a White Pine

The white pine can be distinguished with very little difficulty from any of its associated evergreens. Its leaves which are needle-like, soft and delicate, from 3 to 5 inches long and of a clear green colour are borne in little cluster or bundles. If we pluck these little bundles and examine them carefully it will be found that each is made up of exactly five needles held together with a paper-like wrapper at the base. No other tree growing in our forest from the Atlantic to Manitoba has five needles in a bundle. It is only necessary to recall that the first word of its name 'white' has five letters to remember one of the most distinguishing points of this tree.

Knowing Red and Jack Pine

The red pine (Pinus resinosa) and the jack pine (Pinus Banksiana) both of which occur within the range of the white pine have but two leaves in a bundle. The red pine leaves are two to three times as long as those of either the white or the jack pine and very much coarser than those of the former tree.

The bark of the white pine when young is quite smooth and as a rule greenish-brown in colour. On older trees it is divided into continuous ridges and has a dark gray colour. On red pines the bark is separated into broad irregular flaky scales and of an intensely reddish brown colour. From the colour of its bark the tree gets one of its common names. It might be mentioned here that red pine also commonly goes by the name of Norway pine. The name, however, is an unfortunate choice since it has little or no real significance; the tree is not a native of Norway or of any country in Europe.

Examine the cones!

The cones of the white pine are larger than those of any eastern evergreen. They are from 5 to 10 inches long, slender, slightly curved and stalked. Squirrels collect large quantities and hide them for the seed they contain. The red pine cones are very much shorter than those of the white being from 2 to 2½ inches long and spherical in shape when dry and open.

Decorative planting

Both the white and the red pine may be used to advantage in decorative planting. They are hardy, rapid growing and beautiful at all seasons. Because of the large size they attain they are not as well suited for planting on small city lawns as they are for larger grounds, country places, golf grounds and camp sites. The white pine due to its finer branching and delicate needles has a softer appearance than the red pine which is more rugged looking with its massive clusters of dark green coarse needles.

RED PINE BARK

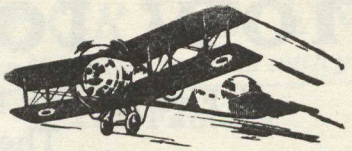
Reddish-brown in color, it separates into broad, irregular, flaky scales. The trunk has a rubbed or scraped appearance. The bark is thick and resists fire fairly well.

How Pine is Used.

White pine produces one of our most valuable woods. It is soft, light, strong in relation to its weight, compact and fairly durable. It has a straight, fine even grain and is not splintery. Its most valuable properties are the ease with which it is worked and the fact that it checks or shrinks but little. It is one of the best woods for building purposes since it can be used to advantage in every part of a building. One of the most exacting uses to which white pine is put is in the making of patterns for foundry castings. For this purpose it is necessary to have wood which cuts easily with or across the grain and above all holds its shape without swelling or shrinking. White pine has these qualities to a greater extent than any other wood.

Red pine is also a valuable lumber producer. The wood, however, is harder, more resinous and somewhat darker than that of the white pine. It is also rather coarse in the grain.

AERONAUTICAL SECTION



NOVEL USES OF AIRCRAFT

FOR the first time in the history of Canada, and as far as is known, for the first time in any country, the aeroplane has been used to carry out the transportation required in connection with an election.

The Provincial elections in Ontario, coming as they did this year on June 25th, presented a tremendous transportation problem to the officials responsible for the proper working of the polls in the James Bay District. Owing to the very late Spring the ground and the rivers in this Northern region were almost impassable and the problem of getting officials into James Bay in sufficient time to compile the proper voters' lists and appoint the proper returning officers, scrutineers, etc. was one that for a time appeared almost impossible of solution.

Five Hours vs. 22 Days.

The experience of the Ontario Government in the operation of aircraft had been so satisfactory, however, that a contract was given to Laurentide Air Service, Ltd., to carry out the necessary transportation by air. The first trip was made on May 23rd from Remi Air Station, situated just North of Moonbeam on the National Transcontinental, to Moose Factory on James Bay. The official in charge of the operation was Judge Caron, who on that occasion made all the necessary preparations for compiling of voters' lists, selection of returning officers, etc. The trip was accomplished in five hours, while the last similar trip undertaken by the same Justice had occupied twenty-two days.

On June 6th a second trip was made to appoint the necessary officials required in connection with the voting. On this occasion Police Magistrate E. R. Tucker had charge of the work and carried on not only election work, but for the first time in history, held court at James Bay.

Fines Indians by Aeroplane

Upon the arrival at Moose Post it was found that two Indians had been arrested for assault and violation of the O.T.A. The normal procedure in the case where offences are committed in the North is for a patrol of the R.C.M.P. to proceed to the point where the offenders are and bring them out to Cochrane where they are tried and sentenced. This procedure, which up until now has been unavoidable, is quite expensive, and involves considerable hardship upon the officers selected for the work. Upon this occasion, however, Police Magistrate Tucker convened court, tried the prisoners, fined them, collected the fine, and returned upon schedule time.

A third flight into the Bay has completed the work of the elections by bringing out the ballots and the returns for these "farthest North" polls.

This particular operation has brought up two altogether novel but very important phases of aircraft operation. The use of aircraft in the administration of justice is most important. It is well known that quick justice is much more effective than delayed justice. The transportation of prisoners or in some cases of magistrates and police officials through the North country is always most difficult and during certain seasons of the year quite impossible. The annals of the Royal Canadian Mounted Police tell of thousands of incidents where men have risked their lives in getting prisoners because of the hardships of the travel on the ground.

It has been clearly demonstrated that the aeroplane has possibilities in this work which have scarcely been touched and which hold tremendous promise for the future.

The unprecedented severity of the fire situation has also been the cause for much use of aircraft. The Ontario Government have pressed into fire prevention service every machine available, with the result that they have been in possession of accurate and prompt information as to the fire situation at all times. This has resulted in a much more effective use of the personnel available for fire fighting than had the work been done merely from ground surveys.

Quick Reports on Fires

One instance of a special survey illustrates very well the possibilities of aircraft. At noon one day severe fires were reported in a district about two hundred miles from the aircraft base of the Laurentide Air Service, at Orient Bay, on Lake Nipigon. A machine left Lake Nipigon at once, proceeded to the scene of the fires, made a careful survey and had a report away by five o'clock of the same day from the nearest telegraph station to which the machine flew after completing its survey. This report covered the situation over the whole of an area which could not have been reported upon by a ground party in less than several weeks, by which time the information would have been useless.

In all, seven machines have been employed in Ontario upon fire prevention work.

Increased use has also been made of aircraft in Quebec. Three machines have been operating in the St. Maurice Valley and have done a most useful work in spotting fires, reporting upon their progress and controlling the preventative work done on the ground.

Air Force Statistics

The headquarters of the Canadian Air Force announces Civil Aviation Certificates and Licenses issued, cancelled and renewed under the various classes as shown for the month ending May 31st, 1923, as follows:—

Private Air Pilots' Certificates

Renewed:—E. R. Grange, Toronto, Ont.; R. A. Logan, Middle Musquodoboit, N.S.

Lapsed:—B. D. Hobbs, Sau't Ste. Marie, Ont.; D. S. Bondurant, Cairo, Ill.; F. G. Pinder, Victoria, B.C.; E. O. W. Hall, Toronto, Ont.

Commercial Air Pilots' Certificates

Issued:—B. de Salsberry, Ottawa, Ont.; F. E. Johnson, Kindersley, Sask.

Renewed:—R. A. Logan, Middle Musquodoboit, N.S.; N. R. Anderson, Hanover, Ont.; A. G. McLerie, Toronto, Ont.; H. D. Wilshire, Montreal, P.Q.; W. H. McCardell, Edmonton, Alta.

Lapsed:—G. T. Howson, High River, Alta.; A. T. N. Cowley, Victoria, B.C.; L. S. Stevenson, Winnipeg, Man.; A. Tapping, Revelstoke, B.C.; W. R. Kenny, Ottawa, Ont.

Cancelled:—W. Sharpe, Windermere, B.C.

Air Engineers' Certificates

Issued:—R. W. Beck, Winnipeg, Man.; J. T. White, Vancouver, B.C.

Cancelled:—W. Sharpe, Windermere, B.C.

Certificates of Registration of Aircraft.

Issued:—Laurentide Air Service, Montreal, P.Q., 1 Vickers Viking Mark IV 18, 2 H.S. 2L Flying Boats; Dominion Aerial Exploration Co., Toronto, Ont., 1 Martinsyde Type "A" Mark 11, 216-1; O. H. Clearwater, Saskatoon, Sask. 1 Curtiss J. N. 4 5010; Johnson Aerial Service, Kindersley, Sask. 1 Curtiss J. N. 4 C. 122.

Cancelled:—W. Sharpe, Windermere, B.C., 2 Standard J. 1.; Price Bros. & Co., Chicoutimi, P.Q., 1 Martinsyde Type "A" Mark 11 216-1; McClelland Aircraft, Saskatoon, Sask., 1 Curtiss J. N. 4. 5010; Holbrook & MacLeod, Hanna, Alta. 1 Curtiss J. N. 4 C. 122.

Air Harbour Licenses

Issued:—Chicoutimi, P.Q. On Saguenay River, at mouth of Chicoutimi River.

Cancelled:—S. E. corner of section 9.31-14 West 4th meridian, ¾ miles S. E. of Hanna, Alta.; Polo Grounds, St. Laurent, P.Q. 9 miles north of the City of Montreal, P.Q.; Chicoutimi, P.Q. On Saguenay River, at mouth of Chicoutimi River.

ENCOURAGEMENT

From Dr. David A. Henderson, Toronto:—

"Check enclosed, the best $2.00 spent this year."

From A. Leonard Davies, Esq., Dunblane, Sask.:—

"I have great pleasure in enclosing check for subscription as requested; I may say that the publication gives me both pleasure and profit."

FORESTRY STUDENTS OF U. of T.

The Forestry students of the University of Toronto have finished their examinations and most of them are in motion for the bush and the black flies. A party of twenty-two undergraduates have left for Biscotasing, to make a forest survey of the Mississauga Reserve. They will estimate timber, make maps showing the location of the timber, young growth and burned areas. Eight more undergraduates are on their way to the West to do work in the forest reserves for the Dominion Government. Five are already working with private companies, three with the Spanish River Pulp and Paper Mills, one with the Abitibi Power and Paper Company, and one with the Theo. A. Burrows Lumber Company. Three of the undergraduates, for various reasons, will not be employed in forestry work during the summer. The members of the graduating class have already started on their life work, ten of them with the Provincial Government, one with the Dominion Government, and one with a pulp and paper company.

The Pulpwood Embargo

An important resolution giving power to the Dominion Government to make regulations prohibiting the export of unmanufactured pulpwood from freehold land, was carried in the House of Commons on June 25th. Sir Henry Drayton asked Hon. Mr. Fielding, Finance Minister, who was in charge of the resolution, to indicate the nature of the regulations which were proposed to make. Mr. Fielding replied that the nature of the regulations had not yet been determined. Sir Henry said that he hoped the prohibition was not to be held up by the Commission which the Government proposed appointing to investigate the matter. Mr. Fielding stated that the Government did not propose to be restricted by the Commission; it might be beneficial, however, to have a report from such a Commission. The Finance Minister added that Canada's forests were becoming depleted and that there was a feeling that the pulpwood should be kept at home.

LUMBERING IN THE PEACE RIVER

Lumbering operations have been conducted on a more extensive scale in the Peace River country during the past winter than ever before, and according to authentic reports from that area seven hundred men were employed in forest activities during the season and the winter's cut has aggregated over 45,000,000 feet of lumber. This work comprises lumbering operations at Jarvie, Chisholm, Smith, Kinuso, Widewater, Springburn, and Grande Prairie in Northern Alberta.

This section is a comparatively new lumbering area. In fact, as a Prairie Province, forest activities are not commonly associated at all with the province. Even in relation to the phases of the Peace River country, greater stress is laid on the vast prairies and lightly wooded sections. But whilst these are extensive, the greater portion of the district, taking into account the mountain slopes and deep valleys of its outer bound, is thickly wooded with valuable timber. The principal varieties include fir in the mountains, spruce, pine, tamarac, birch, poplar, cottonwood and willow.

The Forest Resources of Saskatchewan

(*Continued from page* 433)

and plowing fireguards; requiring burning permits to be secured from the forest ranger before starting a clearing fire during dangerous periods. Posters and personal contact between the rangers and the settlers.

Detection is secured by observation from lookout towers, patrol on the ground, and rapid communication by telephone, heliograph or motor conveyance. Aeroplanes are now playing a large part in other parts of the country in this field. At every ranger station there is located a lookout tower from which the ranger can see over his district. As fast as possible lookout stations are built and equipped, which look over a whole reserve or several districts. At these points a man is kept continually during the fire season, whose sole duty is to observe fires and report them to the proper forest officers. These towers are equipped with fire finders, map, glasses, telephone or heliograph and function exceptionally well until the air becomes so smoky or hazy that only fires originating at short distance can be located. Usually, however, the range extends from 30 to 50 miles.

Suppression is one of the most difficult tasks unless the fire is in its infancy. Time is the most important factor, as minutes count the same as with a city fire department. Immediately a ranger observes a fire or one is reported to him, he is expected to concentrate all his resources to the end of getting it out with the least possible delay. To this end he has already a supply of tools and provisions on hand or immediately available, he knows where he can secure help usually by a prearranged agreement with the settlers and if he finds out that he needs further assistance he calls upon the Supervisor for extra help. During the fire season his saddle horse or team are standing ready for him to be off in a few moments notice or his speeder or car are in readiness. Many aids are provided to help him with his task such as special fire fighting tools, plows, water buckets, pack sacks, fire fighting pumps, special camp cooking equipment, tents, etc. This equipment he is required to keep in proper shape for use at any time and to use for no other purpose.

Until we have controlled the fire situation even in our most severe years, there is little use expending large sums on planting, thinning or other silvicultural operations. Fire losses can be kept to a minimum but not prevented altogether. The matter rests largely with public opinion which has to be aroused not only locally but generally. Carelessness is the greatest sin and the subject has to be kept continually in the limelight in order to secure results.

Silviculture is next to fire protection the most important of forest management. Silviculture of forest crop production is the business of the professional forester. The Forestry Branch is the only organization in the province who attempt to carry on work of this nature. Results are not immediately obtainable as the forest crop takes a number of decades to mature and be ready to harvest as compared with farm crops which are an annual occurrence. As before stated the forest reserves are for regulated use and to this end the timber which is mature and marketable is for sale.

About 10½ million B.F. were sold in 1921 from the reserves in the province and about 1 million B. F. were permitted to settlers for their own use. Thirty-two thousand cords —fuel were permitted during the year and a large part of this was shipped south to the prairie towns.

The cutting of this timber is done under strict regulations so as to prevent undue waste and encourage new growth. The trees to be cut are marked by a forest officer, all brush and debris are required to be cleared up and burned, all marketable material is required to be taken out, as little damage as possible is allowed to be done to the remaining forest, seed trees are left where required to re-stock the cut over areas.

In the fall seed is collected by the rangers and shipped to Indian Head where it is extracted and cleaned, some of it being used there in their seed beds and some sent back to the reserve headquarters, where it is planted in nursery beds and grown under constant care for a few years before the young trees are sent out to stock up barrens and areas where repeated fires have destroyed all forest growth. Each year small plantations are set out on the different reserves, these so far being mostly of an experimental nature in order to determine the hardier species and the best methods of planting. Native White Spruce and Jack Pine have shown very good growth as has Scotch Pine during the past few years. It is the policy of the Forestry Branch to plant up the prairie reserves as fast as funds will permit, while on the northern group natural reproduction of native species is very good and artificial planting, costing from $5.00 to $20.00 per acre, will not be resorted to for quite a while to come, at least until the fire problem is solved.

The forest reserves have many other uses besides supplying timber. The grazing resources are considerable for during the past few years there has been approximately 50,000 head of cattle, horses and sheep grazed each year by about 1,000 permittees. Most of this stock is owned by small ranchers or farmers living in the vicinity of the reserves. In many localities the settlers have organized themselves into stockmen's associations and are running their stock on a co-operative basis. The forest reserve range serves the purpose of a community pasture. There is now 30 of these associations organized in the province using forest reserve range.

Many other minor uses are also made of the forest areas. Settlers and ranchers put up hay which is cut under permit at a nominal charge. Many berry pickers, fishermen, trappers, hunters, etc., use the reserve areas during the year. Summer resorts have been established on some of the lakes and numerous cottages have been constructed. One or two of these resorts attract a considerable number of tourists from the U. S. who visit the reserves during the summer and enjoy camping and fishing.

The question naturally arises as to the cost of this work and the revenue and benefits derived. In this connection the Dominion Government, through the Forestry Branch, is at present expending about $30,000 per year in the province of Saskatchewan on timber protection, administration and management of forest reserves, tree planting and special research work along forestry lines. On forest reserves there is being spent about 3c. per acre whereas the gross revenue being derived is between 1c. and 2c. per acre. The revenue from forest reserves and included timber berths for the year 1920 amounted to $108,-000 or about 2/3 of the expenditure.

For comparison we will select a European forest under intensive forest management. The Prussian State forests with an area of 6,000,000 acres or equal to the present forest reserve area in Saskatchewan, with an expenditure of 37c. per acre, showed a net revenue of 42c. per acre in 1850. Fifty-one years later, in 1901, these same forests with an expenditure of $1.43 per acre showed a net revenue of 1.44 per acre. This goes to show that forest management pays. There are other well managed forests that are showing a net revenue of from $2 to $4 per acre per annum. Therefore, why should not the forests in Saskatchewan be showing a revenue of from $1 to $2 per acre instead of 1c. to 2c. It has been demonstrated that the greater the expenditure on intensive management the greater will be the net returns.

The Forestry Branch has only been managing the forest reserves in this province for about ten years and have now passed through the pioneering stage. In the early days only inexperienced and untrained men were available. Political patronage had its many evils and the recent war gave progress along many lines a decided set back. However, much has been accomplished and we hope that with increasing public support much will be accomplished in the next decade. Ten years is a very short time in the life of a tree or forest when you consider that it takes our fastest growing commercial species at least 100 years to make a saw log.

The aim of the Forestry Branch in administering the lands under its care is to ultimately bring these under such management as will not only protect them against fire, insects, fungus diseases, and other enemies, but will assure and sustain an annual crop equal to the maximum incre-

ment possible on their respective sites. It should be noted that the Forestry Branch is only administering the poorest kind of lands, those that have been logged off, burned over, or have or are now bearing no timber of a very high quality. Most of the desirable stands of commercial timber were previously disposed of under license before the creation of the reserves. It should also be kept in mind that the expenditures now being made are largely in the nature of a capital investment from which the returns will be small until such time as the greater part of the lands administered are brought into a fully stocked condition and this stock sufficiently advanced as to yield returns from thinnings or improvement cuttings.

The future prosperity of this province rests just as much on the proper management of its forest lands as it does on a wise immigration policy or a crop rotation practice on its prairie soils. We cannot continue to mine our forests any more than we can our farm lands and still expect them to retain their maximum production.

New Population from Pulp Plants in New Brunswick

By L. R. Webb,

PROBABLY no single industry has developed as rapidly in New Brunswick during the past twenty years as the pulp industry. In 1903, there were no pulp mills. Today there are five, with a total daily capacity of 385 tons of ground-wood, sulphite and sulphate pulp. In addition the construction of a large paper mill is well under way, and the site for a second mill located. The capital investment in this industry in 1921 was $23,000,000 with an annual payroll of over a million dollars, and giving employment to one thousand men. This does not include the labor required to cut the pulpwood in the woods and transport it to the mills, which requires 4,000 more men.

The pulpwood industry is thus expanding rapidly in New Brunswick as in other parts of Canada. The diminishing supplies of softwoods in the United States and the fact that mills must be established near the raw supply has meant that expansion in the pulpwood industry is moving northward. New Brunswick still ranks fourth among the provinces in pulp production, being surpassed only by Quebec, Ontario and British Columbia. No doubt the time is not far distant when this industry will surpass the sawmill industry in volume. It has resulted already in much closer utilization of the log and in some cases it has been possible for sawmill refuse to be used not only as fuel in the pulp mills, but also as pulp. In the woods operations for pulpwood, smaller and more defective material can be taken out and utilized.

Increasing expansion of this industry has meant a greater demand on the forests. It is hard to realize what an immense quantity of wood is required to feed these pulp mills. As stated above, the daily capacity of all the mills combined is 385 tons of pulp, requiring about 800 cords of pulpwood per day—a whole trainload of wood disappearing daily in the grinders to appear again as pulp increased in value under present prices from $10.00 to $30.00 per cord. Estimating the average stand of timberland cut over for pulp at 8 cords per acre (and this is probably a high average), it means that every day 100 acres of forest land must be cut over to keep the mills operating. Figure this for a year and then over a period of fifty years, and the amount of pulpwood required is enormous. In 1921, 121,110 cords of pulpwood were consumed by the pulpmills, some of which were not running at full capacity the entire year.

A year's supply means a pile of pulpwood in cordwood length piled four feet high reaching for a distance of 350 miles or about halfway around the province. Piled 11 feet high it would reach in a continuous line from St. Croix in the southwest corner of the province along the International Boundary to St. Francis in the north-west corner of New Brunswick. Piled in box cars, it would require an unbroken string of cars reaching from St. John to Sackville. In addition to the amount of pulpwood used in the province, twice as much is exported, thus trebling the length of the annual pulpwood pile which would reach around the province.

Green forests guarantee a perpetuation of this great industry. Burnt forests mean the onward march of this industry northward. For even as forest fires hastened the destruction of pulpwood supplies in the Eastern States and finally stopped the construction of more mills, so will forest fires do the same in New Brunswick, only in a much more rapid manner, unless the annual forest fire damage of the past is prevented, which is only possible if everyone going into our forests is careful and extinguishes his camp fires, his cigars and cigarettes before throwing away

PAPER MILLS NO STRONGER THAN THEIR FORESTS

CANADA IS BY far the principal source of supply of newsprint not manufactured in the United States, says The Commerce Monthly, the organ of the National City Bank of New York. Its capital has gone extensively into the development of newsprint plants near the sources of supplies of pulp. The rapid expansion of the industry in Canada has facilitated the installation of improved hydro-electric machinery, capable of turning out 1,000 feet of newsprint per minute. Such improved equipment renders obsolete many of the older and less efficient plants in the United States, which can be operated profitably only when there is a strong demand for newsprint. Prior to the war exports of newsprint from Canada averaged about 133,000 tons. By 1920 they had increased to 679,000 tons and in 1921 totalled 657,000 tons.

The development of the wood pulp and newsprint industry in North America, which now produces more newsprint than the rest of the world has been on an immense scale and perhaps with more regard for immediate demands than for heathy future growth. In consequence of the partial exhaustion of raw materials, industry in the United States has, for some years, been practically stationary, while in Canada abundant timber resources have facilitated rapid development. In both countries, the the industry in the past has developed on the exploitation of virgin resources. For its establishment on a more permanent basis in the future, a policy of conservation is necessary.

"In the Eastern United States, where the principal mills are located, it has been estimated that present supplies of pulp wood will be exhausted within twenty or thirty years," according to a recent number of the magazine, "although by the extensive practice of reforestation the cut-over areas near the mills could within thirty or forty years be made to yield more than the present consumption requirements of United States.

"Already the pulp and paper mills of some states are importing more than half of their supply of raw material. While considerable quantities of pulp wood are imported into the United States from adjacent freehold lands of Canada, the newsprint manufacturing industry in the United States is beginning to feel the economic effect of having to ship raw material over long distances.

"There are supplies of pulp wood in the United States and its possessions adequate to satisfy the requirements of the newsprint industry for years to come. These supplies, however, are in the Western States and in Alaska, while 90 per cent. of the newsprint mills of the United States are in the Eastern States which are also the main consuming centres. It is impracticable to ship pulp wood a long distance since transporation costs rapidly diminish the margin of profits.

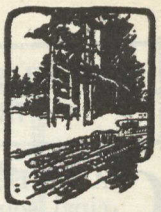
"Apparently the most feasible plan for protecting the source of raw material for the newsprint industry established in the Eastern and Lake States is to adopt a policy similar to that of many European countries in reforesting cut-over and waste areas and conserving present supply. More than 60,000,000 acres of potential forest lands accessible to the present established pulp and paper mills in the United States are now producing nothing. A production of one-third of a cord of pulp wood annually per acre on the waste areas would yield 20,000,000 cords or three times the present consumption requirements in the United States.

A RANGER'S REQUEST

One of the forest ranger signs placed near a favorite camping spot in the Muskoka District reads:

"Have a Good Time in This Woods, But Don't Spoil it For Your Neighbor! Put out Your Fires! Put Them Dead Out!"

BUSINESS AND PROFESSIONAL DIRECTORY



PATENT ATTORNEYS

"Canada's Most Aggressive Patent-Attorney House"

PATENTS SEARCHES THE RAMSAY CO. TRADEMARKS COPYRIGHTS

offers excellent service in preparing Canadian and Foreign applications for

Patents & Trade-Marks

"Correspondence Invited"

273 Bank Street, Ottawa, Ont.

INSURANCE

LONDON — AND — LANCASHIRE INSURANCE COMPANY LIMITED

FIRE: AUTO: RIOT

Security $48,000,000

Chief Canadian Office:

14 RICHMOND STREET EAST, TORONTO

ALFRED WRIGHT, *Manager* **A. E. BLOGG,** *Branch Sec.*

ENGINES AND SUPPLIES

DOTY ENGINEERING COMPANY, Limited

Marine Engines and Boilers, Marine Equipment, Tugs, Passenger Steamers, Cargo Boats

York Building, Toronto, Ont.

Anchors	Centrifugal Pumps	Life Rafts and
Anchor Chains	Dredges	Folding Seats
Anchor Wind sses	Deck Machinery	Port Lights
Ash Hoists	Deplex Pumps	Pumps of all kinds
Ash Ejectors	Derricks	Propeller Wheels
Capstans	Electric Light Plants	Scows
Castings	Gasoline Engines	Steering Engines
Compasses	Gasoline Launches	Tanks
Condensers (Jet)	Hoisting Machinery	Towing Machines
Condensers (Surface)	Heaters	Yachts
Combined Air and Circulating Pumps	Life Boats	Ventilators

CANADIAN AGENTS MOON ELECTRIC TURBINE GENERATORS

STEADY PROGRESS.—The Ottawa Printing Co. Ltd., which prints this publication, has a complete equipment and is capable of producing high class commercial, catalogue and magazine work.

3 and 5 Mosgrove Street Telephone Rideau 295

OTTAWA, ONT.

GUNS FISHING TACKLE

Rifles, Cartridges, Shells, Marble Game Getter, Marble Hunting Knives, Compasses, Cleaning Rods and Brushes. Boots for the Bush, Tents, Pack Sacks, Canoes, Angler and Hunter's Clothing, Sleeping Bags, Ladies' Bush Togs, Duck Back Clothing. Tents, Camp Beds, Chairs. Cooking Utensils. Write for Catalogue.

ALLCOCK LAIGHT WESTWOOD CO., LIMITED

70 King Street West, Toronto, Ont.

FOREST ENGINEERS

R. O. SWEEZEY, C.E., M.E.I.C.

CONSULTING ENGINEER

Hydro Electric, and Pulp and Paper Problems

TIMBER LIMITS

Forestry Reports Financial Reports

136 St. James Street, Montreal

"LACEY" TIMBER REPORTS

(42 Years Experience)

TIMBER ESTIMATES & LOGGING MAPS

James D. Lacey & Co. 350 Madison Ave. New York City

TIMBER ESTIMATING AND MAPPING BOUNDARY SURVEYS

Management of Forest Properties, Supervision of Lumbering Operations, Forest Planting.

P. T. COOLIDGE, Forest Engineer 31 Central Street BANGOR, Maine

HIBBERSON BROS.

FOREST ENGINEERS AND SURVEYORS

Cruising, Mapping, Logging Costs, Flumes, Logging R.R.'s Appraisal on Timber Holdings for Banking interests a Specialty. Information on B.C. Timber supplied at low cost. Sixteen years experience cruising British Columbia Timber

SUITE 701-5 BELMONT HOUSE, VICTORIA, B.C.

Safe and Reliable **TIMBER ESTIMATES** Reports Maps

JAMES W. SEWALL

FOREST ENGINEER

Old Town, Maine. Davidson Building, Washington, D.C.

Largest Cruising House in America

NURSERYMEN

Canadian Tree Seed, Northern Grown Forest Trees, Shrubs and Chinese Paeonies.

EDYE-DE-HURST & SONS, Dennyhurst, Dryden, Ont.

Shippers to H. M. Government

Telegraphic Address, - "Dennyhurst, Dryden, Ont."

PHOTOGRAPHERS

KODAKS AERO FILMS

GLADWISH & MITCHELL

Specialists in Kodak Photography

147 Peel Street - Montreal

LANTERNS X RAY FILMS

Pulp, Paper, Power and Lumber Companies

Abitibi Power & Paper Company

LIMITED

HEAD OFFICE · MONTREAL, QUEBEC

The Largest News Print Mill in the World

Manufacturers

of

NEWSPRINT PAPER SULPHITE PULP

GROUNDWOOD PULP

—

MILLS AT

IROQUOIS FALLS, ONT.

Laurentide Company

LIMITED

———

Manufacturers of

Groundwood Pulp, Sulphite Pulp,

Newprint Paper,

Cardboard

———

GRAND MERE, QUEBEC

Brompton Pulp and Paper

COMPANY, LIMITED

EAST ANGUS, QUEBEC

Manufacturers of

Newsprint Paper, Kraft Paper, Fibre Paper,
Manilla Paper, Box Board, Sulphite Pulp,
Groundwood Pulp

AND

LUMBER OF ALL KINDS

Ontario Paper Company

THOROLD,
ONT.

———

Manufacturers

of

NEWSPRINT
PAPER

H. R. MacMillan Export Company

Limited

All Pacific Coast Forest Products

Vancouver, British Columbia.

A FIRE ALARM — The prosperity of the Pulp and Paper Industry and of many other industries depends on the maintenance of OUR FORESTS

Fires annually destroy more timber than is used by all the industries depending on it. A moment's carelessness may cause an irreparable and national loss. This space devoted to the cause of forest conservation.

by

TRADE MARK

CANADA PAPER CO.

Windsor Mills, P.O.

FOREST FIRES

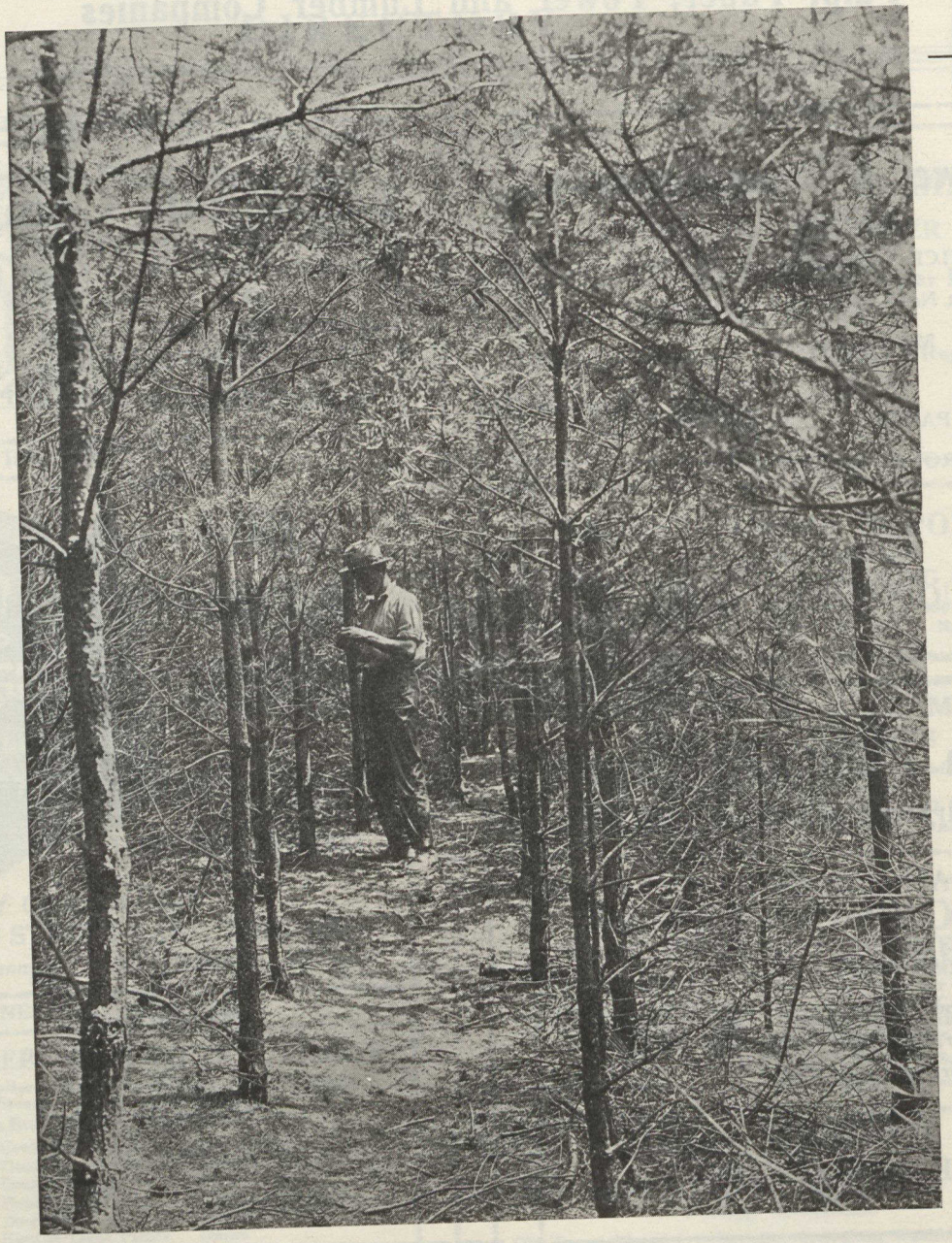
TAKE AWAY JOBS

Size up Every Timber Fire as Your Personal Enemy and Get After Him; Put Out Your Camp Fires. Never Toss Away a Lighted Cigarette. There are hundreds of jobs in a live forest. Dead forests drive out population.

———

This advestisement inserted in the
interests of forest protection by

The Spanish River Pulp and Paper
Mills, Limited



Scotch and Jack Pine plantation, made by Ontario Forestry Branch on sand ridge at Norfolk Forest Station in 1909 (Fourteen years old).

For information regarding reforestation in Ontario, write "Forestry Branch, Parliament Buildings, Toronto.

Department of Lands and Forests

TORONTO, ONTARIO

Hon. BENIAH BOWMAN,
Minister

W. C. CAIN,
Deputy Minister

FOREST FIRE FIGHTING IN SWEDEN

By G. C. Piché,
Chief of Quebec Forest Service

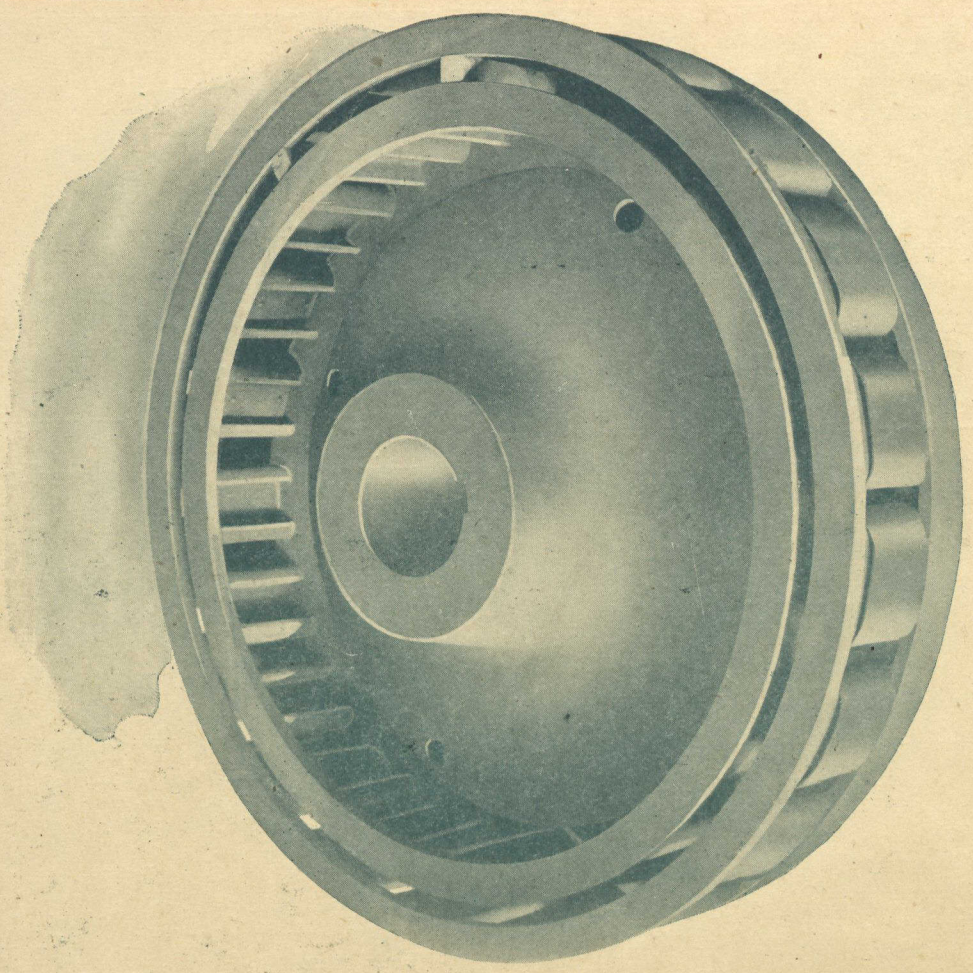
In Sweden every man knows how disastrous forest fires are to his country, and by reason of his great love for his homeland it is not necessary to compel any man by law to fight a fire. Whenever there is a report of a fire, forthwith every farmer in the neighbourhood leaves his work and offers his services to fight the plague, and if the local ranger finds that he is not able to put out the fire with the men at his disposal, he immediately sends a telegram to the Governor of the Province (Lan) asking him to send additional help, and as soon as possible thereafter a regiment of soldiers, or more, is sent by special train to extinguish the fire. I am of the opinion that the reason why the Swedes are so successful in their war on forest fires is that everyone has a veneration for the forest; they know their forest resources are of supreme importance and that almost half the exports from Sweden consist of forest products.

DOUGLAS FIR IN CHINA

THE demand for lumber of all kinds is decidedly on the increase in China and modern building construction is showing a tremendous growth. Douglas fir is the premier wood imported because it is well adapted to general construction purposes and is superior to the hand sawn lumber made by the Chinese out of native pine. The domestic sawmill production of lumber is small, and this also helps the ever-growing demand for American timber.

A prominent lumber importer estimated recently that Douglas fir was coming into Shanghai at the rate of 7,000,000 board feet per month. While it is impossible to check this figure, it is safe to say that the importation and consumption of lumber is now back on a normal basis. The demand for lumber of all kinds is increasing rapidly throughout China, due not only to decided activity in the building trades but also to the steady industrial development of the cities.

Douglas fir is, of course, the premier wood used for construction purposes in China. It is superior to the native pines both in texture and tensile strength, but the great difference in price has sometimes made buyers turn to the cheap native pine for certain classes of work. A prominent importer of Douglas fir recently stated that a marked increase in the importations of competitive woods was noticeable in China and the Douglas fir dealers will have to contend with these in the future. The reason Chinese pine could not seriously compete before was due to the crude, handsaw methods used in its manufacture of planks. Recently, however, the Chinese have started modern saw mills and are making a very good grade of lumber.



Flexible Couplings

Absolutely prevent damage to machinery due to shafts getting out of line.

Permit motors being mounted on separate bases from grinders, pumps, Cams, etc.

We can supply these for horse powers from 30 to 2800

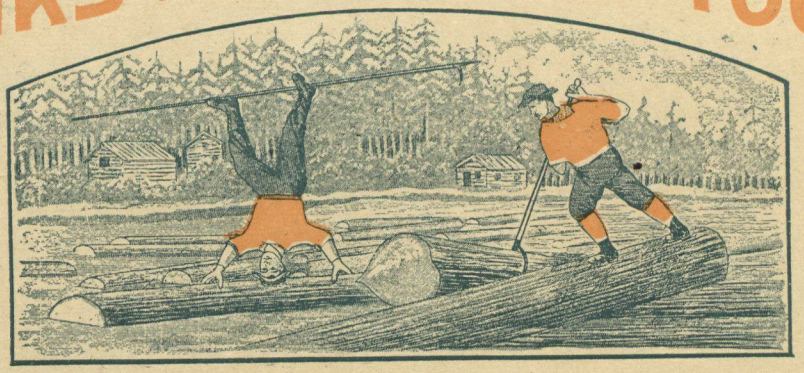
No oiling required; no attention whatsoever; noiseless in operations; remarkable power saver.

The

Waterous Engine Works Co., Ltd.

BRANTFORD, CANADA

PINK'S LUMBERING TOOLS



Boom Chains	Loading Blocks	Timber Dollies	Sockets
Boat Winches	Loading Chains	Snow Ploughs	Bands and Bolts
Pike Poles	Piling Hooks	Horse Capstans	Car Starters
Peavies	Lumbermen's Boats	Whiffletrees	Marking Hammers
Cant Dogs	Hookaroons	Neck Yokes	Saw Wedges
	Timber Carriers		

Manufactured by

The Thomas Pink Company, Limited.

Pembroke, Ontario

"The Linn HAULS the Load"

Under Varying and Adverse Conditions

Logging Operations in the Canadian Woods During the Past Winter Have Abundantly Proven the Particular Qualifications of

THE LINN LOGGING TRACTOR

To Perform the Work for which it was especially designed and constructed.

The above illustration shows the Linn Logging Tractor hauling logs on the operation of the International Land & Lumber Company, Limited, near St. Felicien. (District ofSt. John, Que.)

In northwestern Quebec the snow came very late last winter. At the time the photograph was taken there was barely a foot of snow in the bush—yet, the Linn Logging Tractor was hauling its trains of logs to the dump—over poor roads—up bad grades and down steep hills.

The International Land & Lumber had completed their haul by the first of March. Their haul was about seven miles—and, **even though their overhead charges included 100 per cent. depreciation on the Tractor in the first year,** they report that, including all their costs from skidway to dump, (including the cost of hauling water for sprinkling over a distance of four miles from the nearest water hole to the point where it was used) **their logs cost but $3.50 per thousand feet at the dump.**

For further information concerning Linn installations, write or wire.

—LOGGING DEPARTMENT—

MUSSENS LIMITED

PHILIPS PLACE BUILDING MONTREAL