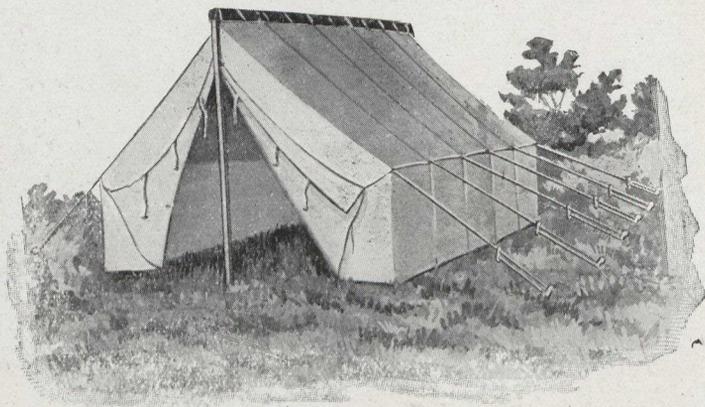


Canadian Forestry Journal  
April 1920

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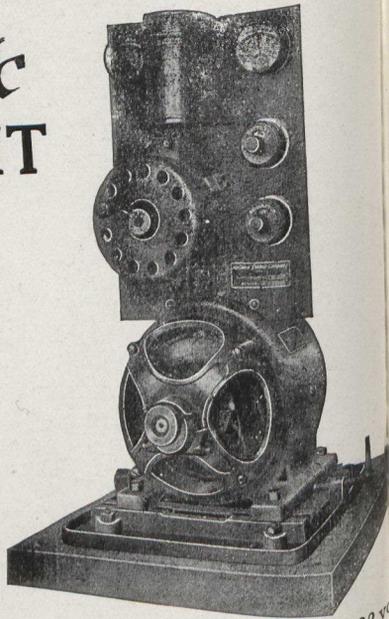
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# Canadian Forestry Journal

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No. 4

## Tree Fences to Block Snow and Sand

by B. M. Winegar, Montreal

*How the Railways are Coming to Use More Plantations in Place of Unsightly Boards*



A plantation of Carolina Poplar set out in 1916 to prevent the drifting of sand near railway tracks. These cuttings were about half an inch in diameter and 12 inches long. They cost about two cents apiece. Picture was taken one year after planting.

Railways use two kinds of fences for snow, a portable one which can be shifted any distance from track and a permanent one which is established on the right-of-way line. The former fence is taken down in the spring and piled up until fall. The advantage of this type of fence is obvious, being built in 12-14 and 16 ft. panels, it is easily handled. The main-

tenance, however, is very high, and the expense necessary in moving considerable. The temporary fence, however, is unsightly. Tree fences recommend themselves on account of their original cost, the small maintenance expense involved after plantations have been established several years, and because of their appearance. Their disadvantage is their lia-

bility to fire. Extra precautions are necessary on the part of the track forces to keep fire from getting into the plantation.

There are some fine examples of tree fences in the orchard belt of Ontario. Some of these fences have evidently been located at least fifty years. On the wind swept prairies too, settlers have found trees an excellent protection both in winter and in summer.

#### Tree Fences Are Now Cheap.

Railway officers have been aware of the practicability and desirability of this type of fence for some time, but the price of lumber and posts, until recently, has not made tree planting very attractive. However, tree planting today, in Eastern Canada, can be done for less than one half the cost of wooden fences. Live fences are effective and economical. After the third and fourth year, no maintenance is required. They are decorative and do much to make the right of way attractive.

Planting has been done very successfully by the Intercolonial in northern New Brunswick, since 1887. Here the local red spruce has been dug up from nearby fields and transplanted. This work is still being carried on.

When the trees reached a height of 9 feet to 10 feet, the tops are trimmed. Trees from 18 inches to 36 inches in height have been planted in two rows. From time to time any failures have been taken out and replacements made. This is perhaps the most striking example of just what can be done along this line.

The Canadian Pacific and the Soo line have been planting for a number of years in the prairie country. Moisture conditions limit the varieties to deciduous shrubs and trees. From six to eight rows of shrubs and trees are required. Locust, carragana, willow and poplar are the species used. Attempt is being made after the plantations have been several years located, to interplant with spruce.

#### Pine and Spruce are Best.

The ideal snow fence appears to be

the white or red spruce of this country, or the Norway spruce, planted two or three rows staggered. The trees hold their foliage well to the ground. They grow rapidly making from 10 to 16 inches annually, after having become established. They make an excellent snow barricade and are striking in appearance.

Balsam, though of a more rapid growth than spruce, is subject to more enemies, is considerably more brittle, and is not so satisfactory in holding its lower branches. It should do well, however, in mixture.

Cedar is used extensively, and although of slower growth than any of the other species planted, when once established, does extremely well. It makes an even more artistic show than perhaps any of the other species.

North of Lake Superior and west to the prairies where jack pine predominates, the use of this tree is to be recommended. It is of quick growth, but has the drawback of losing its lower branches quickly, especially when planted close. It should be used in mixture with spruce, balsam or cedar. Norway pine has the same growing characteristics, but like the Jack pine, it will probably do well in mixture. Use of hemlock has been recommended, but it would appear the least satisfactory of all trees mentioned.

Generally it can be stated that the best conifers to plant in any locality are the trees which thrive there under natural conditions.

It requires seven years at least to get sufficient growth to make effective snow breaks.

The factors which effect the cost of planting trees and on which success of the plantations depends are, first: the distance which trees have to be hauled. If it were possible to lift trees only a short distance, say within half a mile, the loss would be greatly reduced. It is obvious, however, that where trees are transported from wagons to cars and then taken to destination, drying out of the roots occurs, and the loss is greatly increased.

Proper weather conditions are necessary for this work. Trees which are handled in cool, damp weather have a much better chance than if transplanted when weather is dry and hot.

There has been much discussion as to the time when trees should be planted. Successful work has been done in the spring, and again from the middle of September till heavy frost sets in.

Where soil is very heavy and difficult to work, and where heavy boulders are found, the expense is greater and the difficulty of establishing plantations much increased. If it is necessary to use a spade to work the ground, roots of the trees are much more likely to get insufficient space than where ploughing is done.

The following methods have been suggested for establishing tree fences. Trees are planted from 2 feet to 2½ feet apart in rows. These rows are from 2 feet to 3 feet apart. Two to three rows are necessary.

Nursery stock being impossible to obtain at reasonable figures, we are forced to depend largely on trees dug from the wood. Greater loss is anticipated from this class of material.

The smaller the trees planted, the greater the chance for success. The cost of lifting smaller trees and planting them is much less than the expense involved in lifting bigger stock. It is not practical, however, to use large trees. The expense would be too great, and handling and loss very high. Even nurseries do not handle large conifers except at a prohibitive rate. Nursery stock is, of course, much more easily handled than wild grown trees. It appears to be good practice when natural grown stock is used to plant trees from 18 inches to 36 inches in height.

#### Cultivating the Ground.

The ground to be planted is prepared in the spring or fall preceding the planting. Ploughing is done and a disc is used. If trees are to be planted in the fall, the ground should be cultivated during the summer season to keep down the weeds. It ap-

pears to be good practice to plough a strip about 12 feet wide, three feet of the plantation on either side being left for fire breaks. It is necessary to keep these fire breaks maintained for several years. Cultivation should be done for at least three or four years. Extra precaution should be taken to see that grass fires are not let run close to trees.

In 1916 the Canadian Pacific having experienced considerable trouble with hot boxes, caused by drifting sand, established a plantation at Vaucluse, on the line between Montreal and Quebec. Carolina poplar cuttings and Scottish pine seedlings were used; 80% of the cuttings have made a showing and are now growing at the rate of about three feet annually. There was no loss in the pine trees. They now average over 12 inches per year. This plantation is effective as a sand as well as snow break.

It is recommended that for this class of work only conifers be used, deciduous trees being of value in summer time only.

#### N. B. FORESTERS' RECORD

At the annual Hammerfest of the Forestry students of the University of New Brunswick, Mr. G. H. Prince, in the course of an address said the University of New Brunswick had graduated twenty-eight foresters in the nine years that degrees have been granted to foresters. Almost all of them were still in the profession and sixteen of them held important executive positions in Canada with the federal and provincial governments while several others were practicing the profession in other parts of the world. Mr. Prince expressed the hope that the University would continue to supply the profession with men of ability.

#### THE FOREST IN THE LEAD.

The value of all the field products of Northern Ontario in 1917 was \$7,041,327.

The value of the forest products of Northern Ontario in 1918 was over \$22,000,000.



An example of the infinite detail obtainable in Aerial Photo-Topographic work—although the picture loses considerable detail in reproduction, the different varieties of trees and crops can be discerned. In one instance even the furrow-marks in a recently ploughed field are shown.

To transform a continuous series of these pictures into a correct map of the country, involves consideration of the elevations at which each picture was taken and degree of inclination from the horizontal plane as well as other features of a highly technical nature.

A simple mosaic is not a true record but an absolutely correct scale map can be made from aerial photographs, given the necessary data and technical skill. This method is many times quicker and cheaper than those at present employed.



Scenes on the Quesnel River, British Columbia.





**BURNED MANY TIMES.**

Note the number of stumps and the absence of reproduction.



**GENERAL VIEW OF AN AREA BURNED REPEATEDLY.**

Forest growth scattered. Note the soil erosion.

## THE PROFITS OF TREE PLANTING IN FRANCE

by Dr. B. E. Fernow

The movement for recovery of waste lands in France dates from the beginning of the 19th century, and today reforestation by state, communal and private effort, encouraged by legislative acts during the last sixty years, has restored more than 2,500,000 acres of lost ground to forest production.

There are four definite regions of large extent in which systematic effort in this direction has been made, namely, the sand dunes of Gascony, the Landes of South-western France, the sandy plains of La Sologne, the limestone wastes of Champagne, and the mountain slopes in the Vosges and Jura-Alps.

The sand dunes on the coast of France comprise around 350,000 acres; those on the coast of Gascony, in South-western France, alone have an extent of nearly 250,000 acres, these being the most important and having a long time endangered the adjoining pastures and fields. It seems that the land occupied by dunes was originally forested and that these were created by deforestation.

As early as 1717 attempts at reforestation were made by the inhabitants, and from that time on small plantings were sporadically made. But the inauguration of systematic reforestation was begun only after a valuable report by Brémontier, who in 1765, secured, as chief engineer of the department of Bordeaux, a sum of 100,000 to be employed in ascertaining possibilities of making a canal through the Landes and of fixing the dunes. As a result of this beginning, a method for their recovery having been by 1793 experimentally determined by Brémontier, 275,000 acres of sand have been fixed during the last century. The revolutionary government in 1799 created a Commission of Dunes, of which Brémontier was made president, an annual appropriation of \$10,000 was made,

later (in 1808) increased to \$15,000. In 1817 the work was transferred to the Administration des Ponts et Chaussées. The appropriations were increased until in 1854 they reached \$100,000 a year, and in 1865, the work being nearly finished, the dunes were handed over to the forest administration. There being still about 20,000 acres to be recovered, this was achieved in 1865, when 200,000 acres had been reforested at an expense of about \$2,000,000, and an additional expense of \$700,000 to organize the newly formed pine forests. These, at present with their resinous products and wood are furnishing valuable material. An unfortunate policy of ceding some of these forest areas to private and communal owners was inaugurated just as the planting was finished, so that at present only 135,000 acres remain in the hands of the state. The returns from the sales, however, reimbursed the cost of the reboisement in excess by \$120,000, so that the state really acquired for nothing, a property now estimated to be worth \$10,000,000.

### Another Forestation Success.

To the eastward of this region of dunes stretch the so-called Landes, a territory triangular in shape, containing 2,000,000 acres of shifting sands and marshes, on which a poor population of shepherds (on stilts) used to eke out a living. In 1837 an engineer of the administration of bridges and roads conceived the idea of improving this section by reforestation, and at his own expense recovered some 1,200 acres in the worst marsh by ditching and planting. The success of this plantation invited imitators, and by 1835 the reforested area had grown to 50,000 acres. This led in 1857, to the passage of a law ordering forestation of the parts of the land owned by the communities, the state at the same time undertaking the expense of building a system of

roads and making the plans for forestation free of charge. The communities were allowed to sell a part of the reclaimed land in order to recover the expense. From 1850 to 1892, private owners, imitating the government and communal work, 1,750,000 acres were covered with pine forests at a cost of \$4.00 to \$5.00 per acre, or, including the building of roads, a total of around \$10,000,000 had been expended. In 1877 the value of the then recovered area was estimated at over \$40,000,000, this figure being arrived at by calculating the possible net revenues of a pinery under a 75 years rotation, which was figured at \$2.50 per acre, with a production of 51 cubic feet per acre, and 200 quarts of resin (at \$3). An estimate of recent date places the value of this area at \$100,000,000.

#### How French Forestry Makes Money.

Centrally located between the valleys of the Loire and the Cher, near Orleans, lies the region of La Sologne a sandy, poorly drained plain upon an impenetrable calcareous sub-soil giving rise to stagnant waters; this region too, had been originally densely wooded, and was described as a paradise in early times; but from the beginning of the 17th century to the end of the 18th it was deforested, making it an unhealthy, useless waste. By 1787, 1,250,000 acres of this territory had become absolutely abandoned. About the middle of the 19th century a number of influential citizens constituted themselves as a committee to begin its work of recovery, the Director-General of Forests being authorized to assume the presidency of that committee. As a result a canal of 25 miles in length, and 350 miles of road were built, and some 200,000 acres (all non-agricultural lands) were planted with Maritime and Scotch pine, the state furnishing assistance through the forest service and otherwise. A set-back occurred during the severe winter of 1879, frost killing many younger plantations, which led to the substitution of the hardier Scotch pine for the Maritime pine in

the plantings. The cost per acre set out with about 3,500 two-year old seedlings amounted to \$5.00. An estimate of the value of these plantations places it at \$18,000,000, so that land which 50 years ago could hardly be sold for \$4.00 per acre, now brings over \$3.00 as an annual revenue.

In the province of Champagne south of Reims, arid limestone wastes of an extent which in the 18th century had reached 1,750,000 acres, are found. About 1807 the movement for the recovery of these wastes began first in a small way, gaining strength by 1830 after some sporadic experiments had shown the possibility of reforestation, and today over 200,000 acres are being planted. It is interesting to note that land which 50 years ago was often sold without measurement by distance, "as far as the cry would carry," and never for more than \$4.00 per acre, is today worth \$40.00, at a cost for planting of less than \$10.00. The stumpage value of a thirty years' growth is figured at from \$50 to \$100. The total forest area is valued at \$10,000,000 with net revenue from the 200,000 acres of \$2.00 per acre.

#### PENNY WISE--POUND FOOLISH

(Pacific Coast Lumberman.)

The recently announced resignation of Colonel Henry S. Graves, as Chief Forester of the United States, brings once more to mind the stupidly parsimonious scale of salaries paid in the forest branches of our own Civil Service.

Sometimes we are forced to the opinion that only the least intelligent men find their way into the high places of government. It is an unpleasant thought! Yet what else can we think, when we find government administrative heads seemingly unable to understand that low salaries on responsible posts mean book profits only — that away from the soothing figures of the accounts they nearly always mean great losses to the nation through inefficiency, dissatisfaction and the never-ending disorganization caused by a frequent change of personnel.

## Sir Andrew's Forest Obsequies

When the President of the Canadian Pulp and Paper Association is persuaded to deliver an address before the Academy of Medicine on the Thyroid Gland, perhaps the newspapers will give the delivery as much publicity as the recent speech of Sir Andrew MacPhail on Forestry. Sir Andrew is professor of "The History of Medicine," at McGill University. He spoke before the Canadian Pulp and Paper Association on the economics of forestry and repeated the address before a Toronto audience. Probably five thousand people read parts of the address from newspaper columns to a hundred who sat beneath the speaker. The effect of the deliverance has been in direct ratio to Sir Andrew's standing as a scientist and editor, and without relation to his scholarly inexperience in the technical subject with which he chose to deal.

The Forestry Journal has not the slightest intention of considering the address seriously. We give below certain excerpts typical of Sir Andrew's conclusions. There are many men in Canada who hold such fragile opinions, men who have picked up a bit here, a bit there, but who do not muster enough audacity to put the product forward as a treatise on a complex subject, tested by two cen-

turies of scientific effort, and by half a dozen great nations.

No, Sir Andrew, the principles of forestry, applied to the forest have given one European nation a forest property worth seven billions of dollars in not more than one hundred years. She grew it from stuff as promising as the Duck Mountain Reserve in Manitoba, if you've seen that. We can do things equally great in Canada. To suggest nowadays that Canadians have deliberately built up a pulp and paper industry with 250 millions invested, and an export business of 100 millions a year, only to sit in the parlor car and watch the forests disappear and the mills rot.—No, Sir Andrew, that is almost improbable. It happens in Tien Tsing, but nowhere near Three Rivers.

"So you must not be too disconsolate and think too much of the end," advises the good physician.

Once a train came rushing toward a river bank; its speed was fifty miles an hour. Surely it must plunge to a fearful destruction! The faces of all beholders were blanched with terror. But it was all for naught. The train happened to find a bridge and passed across the river without vibrating a teacup.

There was a bridge in front of your eyes all the time you were speaking, Sir Andrew, but you couldn't see it. It was hidden by a Tree. R. B.

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## The Doctrine of "All Is Lost"

(Excerpts from Sir Andrew MacPhail's Speeches)

"About a year ago, after five years' absence, I came back and looked upon these woods. I found that what had happened was precisely what had happened throughout the whole of Canada; that the wood had been decaying, and into the holes caused by this decay had come disease, because that is the law. That is the law of human pathology, as well as the law of the forests, that wherever you have

age, and wherever you have sickness, and wherever you have age and weakness, disease will follow in its train. . .

"If you are disposed to ask advice, the advice that one would give you would be to continue in your work, get rid of all the pulp wood that exists as quickly as possible, for this reason, that if you don't, it will only perish, and we of this generation might just as well get what we can out of it.

So, sir, count all that you make as just that much to the good, and when it is finished, whether it be six years or in three hundred years, what then will come? Observe this: There are two things which you have never seen—one thing that is as good as it looks, and another thing that is as bad as it looks. That is true of the pulp and paper industry, and if it would all disappear the situation would not be as calamitous as you might suppose. . . .

"So you must not be too disconso-

late and think too much of the end and when that end will come, and I have no doubt, whenever that end does come, that you will be able to put your mills and your plants to other good purposes. Nor need we of this generation concern ourselves too much about the future. We have done our part in the world, and let those who come after us do their share, and if they look into your records they will find that you tortured and tormented yourselves into finding a solution."

### *The Tree Nursery at Indian Head*

The tree nursery at Indian Head, Sask., comprises three-quarters of a section lying about two miles southwest from the town of Indian Head. This section was originally school lands. In 1903 arrangements were made for the north-east quarter of this section to be taken over by the Department of the Interior for nursery purposes. A few years later, as the work extended, the north-west quarter was added, and again a few years later than this the south-west quarter was again added.

The general character of the land is somewhat rolling and the soil a moderately heavy sandy loam. There is a deep coulee running through a portion of the property on which a dam has been established, and there are several small natural bluffs of poplar scattered here and there, which add some natural attractions to the site.

The first buildings were erected in the summer of 1904, and the first plantings, consisting of an outside shelter belt on the north-east quarter, the grading of the roads and the planting of the ornamental grounds was done in the spring of 1905. This quarter was gradually gotten under cultivation, and the whole of this quarter is now devoted to the growing of nursery stock with the exceptions of such portions as are occupied by the buildings, ornamental grounds and permanent shelter belts.

The nursery plots, consisting of regular sized plots of approximately one to two acres, are divided by cara-

gana hedges for shelter purposes. The ornamental grounds consist of a main entrance drive approximately a quarter of a mile in length, bordered on each side by plantings of ornamental flowering shrubs, evergreens and hardy trees. In the neighborhood of the buildings fairly extensive lawns were laid out, and these are bordered by ornamental shrubs, perennial plants and so on.

The buildings on the north-east quarter are well sheltered by permanent belts consisting largely of conifers, which have developed wonderfully in the past few years.

The south-west quarter, which was taken over most recently, is rather rougher than the other land and has more waste land on it in the nature of sloughs, and some alkali spots, and up to the present has been devoted entirely to the growing of grain and hay for the horses needed on the nursery for labor purposes. The whole of this new quarter is not yet entirely under cultivation.

There is now a very satisfactory equipment of buildings, consisting of the Superintendent's residence, foreman's residence, two boarding houses, stable, two packing sheds and one workshop. Being connected up with the pipe line which supplies the town of Indian Head, there is a supply of very good water, but at times the supply is not any too plentiful. There is also an individual electric lighting plant to furnish light to the buildings.

## How Paper is Made

By J. N. Stephenson, M.S.

Editor of the Pulp and Paper Magazine of Canada

### An Interesting Description Following the Process from the Tree to the Finished Roll

To tell how paper is made in the space of a brief article is a difficult problem, but it will be possible to describe at least some of the more important and interesting features of the manufacture of Canada's most important manufactured product. Canadian paper mills manufacture every standard grade and many special varieties of paper, but the kind which makes up the greatest part of the production is newsprint paper. The annual output of newsprint is not at the rate of 800,000 tons, and within another year will be 900,000 tons, or more. It is this kind of paper which

doubtless is most interesting to readers, because about 15 per cent. of the output is used for printing the news of the day in Canadian newspapers, and the rest is exported principally to the United States at a rate which practically amounts to the shipment of \$5,000,000 of gold each month, with a consequent stabilizing effect on the rate of exchange. It will be appropriate therefore, if this description is limited to the manufacture of newsprint paper, although the making of other grades involve processes and machinery of a most interesting character which cannot be explained here.



A river of wood destined to feed the daily demand for 40 million newspapers in Canada and the United States.

The manufacture of newsprint paper begins with the tree, so that it is of the greatest importance to take good care of Canada's forests, whose spruce and fir form the foundation of the paper industry. When the wood arrives at the mill, either by floating down the rivers or hauled by rail, it must be sawed into blocks from two to four feet long, and the bark removed. For newsprint paper this is usually done by tumbling the blocks in huge barrels made of steel angle irons. Part of the barked blocks go to the groundwood mill and the rest to the sulphite mill, since newsprint paper contains approximately 80% of groundwood 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 screwed 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.

#### Wood is Cooked to Make Sulphite Pulp.

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.

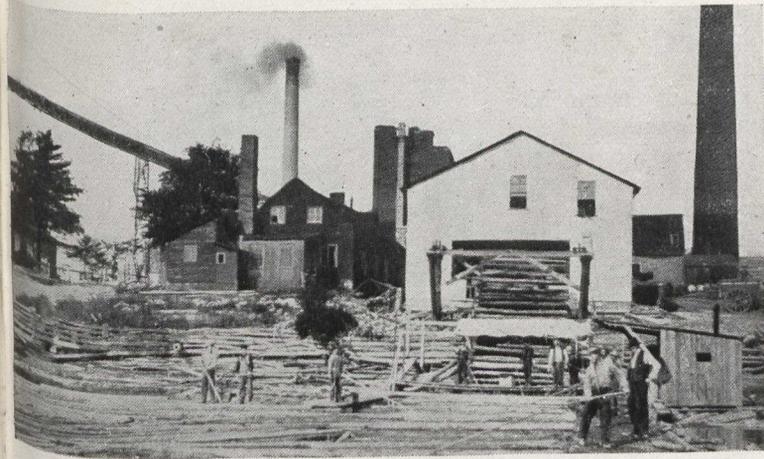
When the cooking is complete the chips are blown from the digester to a blow-pit where they strike a plate and are broken down to a pulp form. The pulp is washed to free it from residues of the cooking liquor, and the non-cellulose constituents of the wood. After being washed, the processes of the ~~washing~~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

#### The Paper Mill is an Interesting Place.

One would hesitate to believe that the milky-looking liquid passing 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.

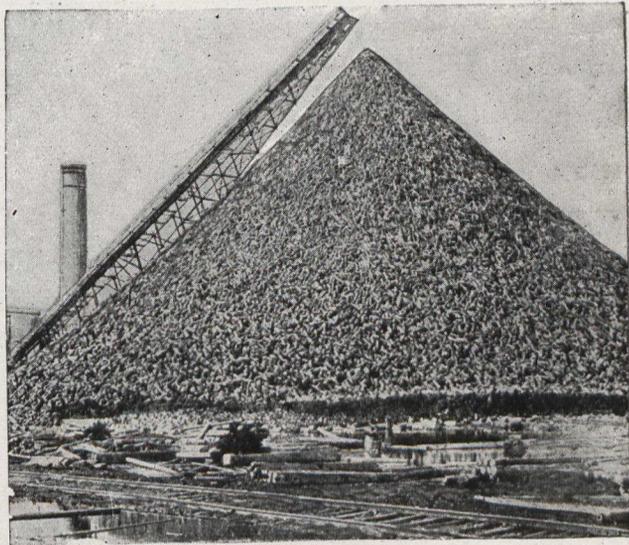
In the most modern mills, where the production is kept high and manufacturing costs low, the pulps are simply run from the "slush" storage, in the proper proportions, into large mixing tanks, from which it goes to the paper machines. Many mills still use the original mixer, the beater, and necessarily 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



Log Hoist and  
Slasher House  
at the receiving  
end of a  
Pulp Wood  
Storage System.

A travelling conveyor which is moved on tracks along the face of the block pile is frequently used where wood is brought in on cars and in some cases also for stacking the wood on either side of the conveyor which carried the blocks to it.



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 interweaving 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 Fourdiner, 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 feet per minute, and the

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A pretty good firm is Watch & Waite, And another is Attit, Early & Layte; And still another is Doo & Dairet; And one of the best is Grinn & Barrett.

(Martin's Papyrus.)

paper is carried automatically from one end to the other.

#### A Marvelous Machine.

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 or \$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 interweave. 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.

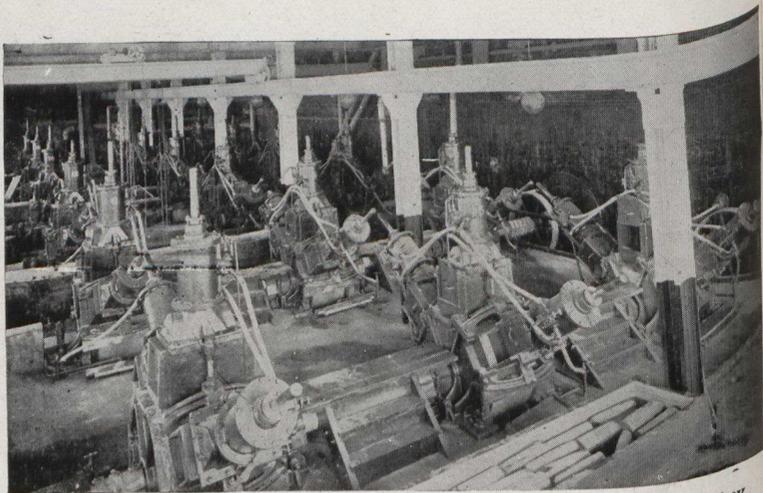
Due to the speed of the machine and the limited length of the wire, only a portion of the water can drain through. An additional amount is drawn out by suction, applied through



#### THE SAW DECK OF A PULP MILL.

Full length logs are seen coming through the doorway, and as they are carried forward by chain conveyors, are cut by the gang of saws into the required lengths, which may be 24, 32 or 48 inches. In the foreground is a man sharpening one of the huge saws with an electrically driven emery wheel. From this point blocks are conveyed to the block pile for storage, or may first be sent through the barking department.

This is a picture of the grinder room of a mill making mechanical pulp. The wood is seen floating to the grinders and in each of the second and third grinders in the first row a pocket is opened ready for wood to be charged. The door is then closed and water pressure forces a piston down against the wood, which is thus held firmly against the rotating stone, the lower edge of which is seen on the second stone. Under this is a pit to catch the fibres as they are ground off the log by the stone and washed from the stone by a stream of water.



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 interweaving of the fibres is concerned, and it contains about 90 per cent. of moisture. In order to improve the firmness, texture and finish and to remove more water, the sheet is passed through several pairs of "press" rolls, carried by fine woollen felts.

#### Evaporating the Water.

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 that can be accomplished is to deliver a sheet about 35 per cent. 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.

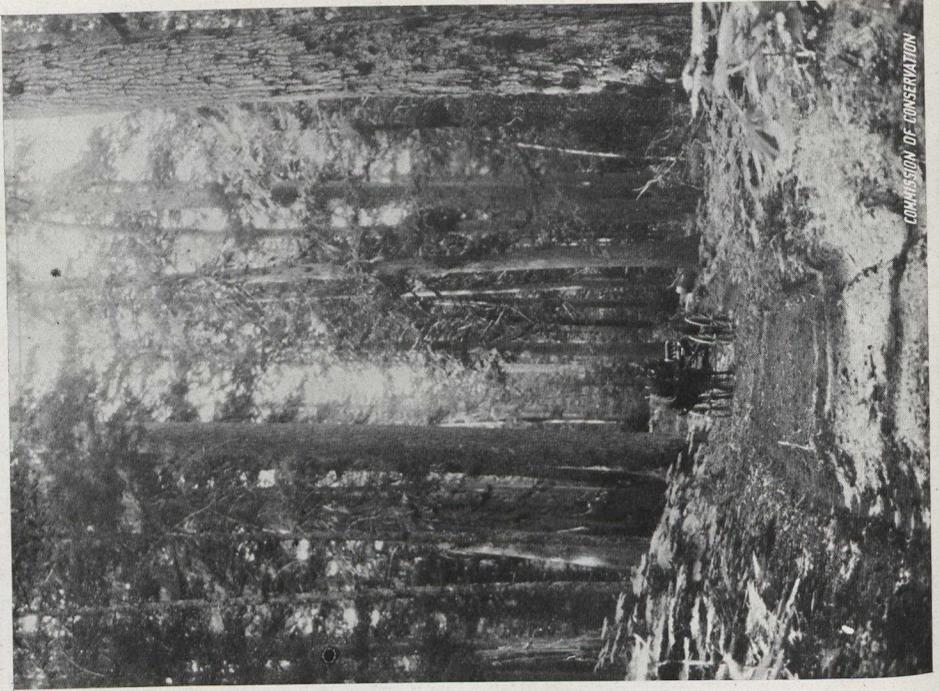
For special effects an extra high finish is sometimes required. To get this, the strips are passed through the super-calender, a calender stack made up of alternate rolls of steel and compressed paper or cotton. A very high luster can thus be obtained, the paper often going through several times. The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

Forest fires drive out population.  
There are no jobs in dead forests.

Canada has not one acre of timber to throw away.



Sit'a Spruce and Cottonwood in Skeena Valley, B.C.



Douglas Fir in Fraser Valley, B.C.

# The Forester's Task in the Prairie Provinces

*With Careful Management Canada  
Can Build Up the Rich Forest  
Properties Achieved  
by Europe*



During the late war the woods of England, the plantations of Scotland and the carefully managed forests of France and Belgium were for many months felled as fast as axe and saw could cut, for use in the trenches and the many other uses that the war had for wood. The question confronting those countries today is, how are these forests to be replaced, and how is the demand for wood in the future to be met. These questions are occupying minds not only in those countries, but also in countries that will have to help in providing the supply.

We used to believe that Canada's timber supply was inexhaustible, now we know better. While our information regarding the quantity of remaining timber is not yet complete, we have, however, progressed sufficiently far in our investigations to know that our supply of timber is definitely limited.

Our saw timber resources have been estimated at various quantities ranging from 500 billion feet board measure, to 9,000 feet board measure. These figures convey little idea until we learn that the largest of these estimates is not more than would be consumed by the United States and Canada together at their present rate in twenty years. Canada's timber, therefore, is not more than enough to supply the demands of this continent for more than twenty years, provided that during this period we lost no standing timber by fire. As a matter of fact our losses by fire are still large.

## Can Wood be Replaced?

It might be pointed out by some of you that in many respects wood is being replaced by other materials. To a certain extent this is true, but figures, as far as we have been able to get them, do not bear out the view that the use of wood is decreasing. For some uses there has been a decrease, but to counteract this, new uses are constantly opening up. A list of a few of these new uses include artificial silk, imitation leather, paper towels, cardboard packing cases, insulation for electric cables, wooden paving blocks, etc.

The rate at which wood is consumed in the manufacture of paper in Canada has steadily increased. In 1916 the quantity of pulpwood cut amounted to over 2,800,000 cords, and to give you some idea what this quantity of wood represents, I might say that if it were all in four-foot lengths, and piled four feet high, the pile would reach a distance of 4.292 miles, or in other words from Vancouver to Halifax, and out into the ocean one-fifth of the way to Liverpool. The lumber sawn in Canadian saw-mills in one year, if placed in one pile, would make a cube a quarter of a mile to the side, or fill a freight train long enough to reach from Calgary to Fort William, and then half way back to Winnipeg. Or it would build enough five or six roomed houses to house comfortably one million people.

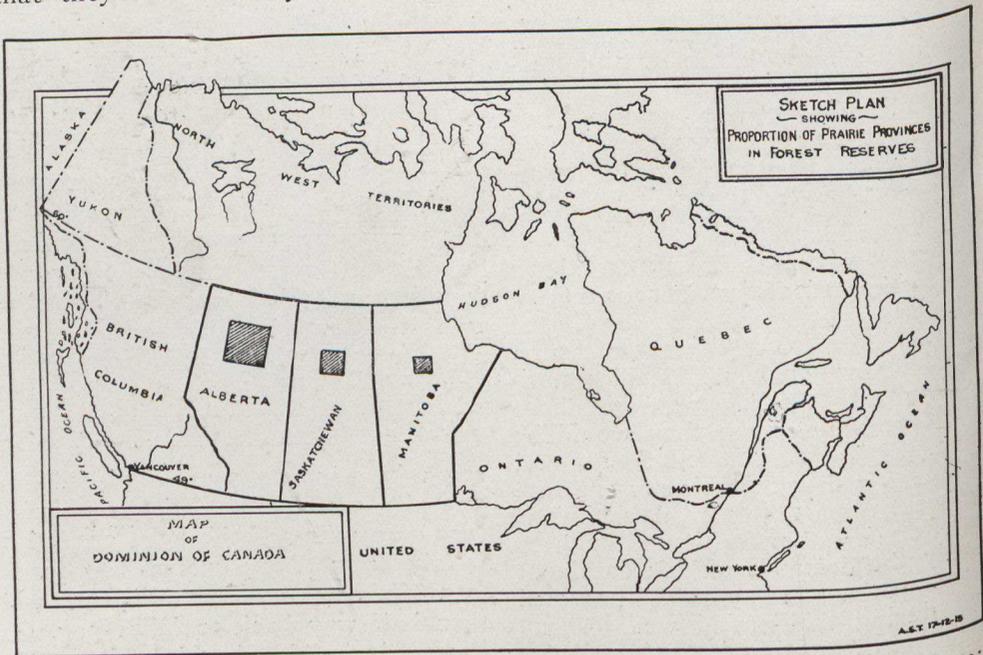
### Why The Forest Reserves?

With no decrease in the demand for wood, and a constantly decreasing supply, it is reasonable to believe that means must be taken to conserve what we have and provide for a future supply. Fortunately the forest is not like the mine. Once the mineral is out of the mine the mine is useless. The forest, however, can be restored, even though cut clean, and in time under proper management it will yield as good, or probably better, crops than the one first removed. With this object in view the governments of the Dominion and some of the provinces have set aside many million acres as forest reserves. The name "forest reserve" is perhaps not wisely chosen for these areas, since it conveys the idea to many that their purpose is to withhold the timber in them for use. The term "National Forests" as used by the United States for similar areas, would perhaps be more appropriate. The forest reserves are areas that cannot be profitably farmed. They are of such a nature that they would not yield a farmer

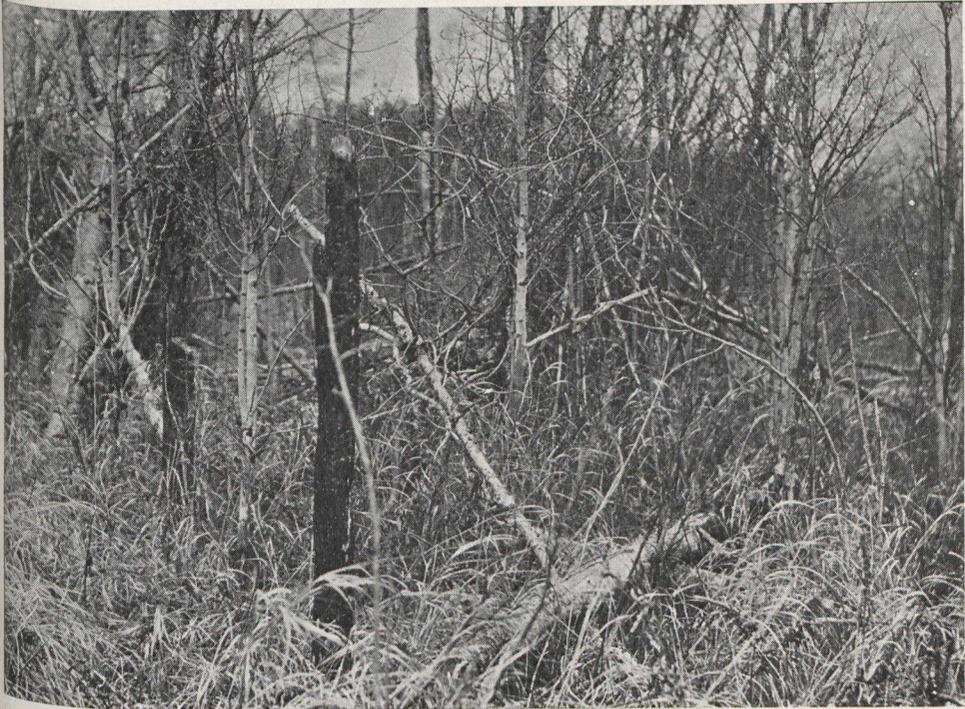
a proper living. The farmer requires good soil and in such a position that it can be cultivated. Not so with the forester, he asks only for lands the farmer cannot use. In the older provinces there are many instances where areas of soil unfit for farming were opened up for settlement to earnest men and women anxious to make a home for themselves. After drudging away the best part of their lives they were compelled to give up or else they continued until all ambition had gone and their degenerate families became subjects for public support. Let us hope that the newer prairie provinces will not make the mistake of the older provinces.

### To Aid West's Water Supply.

As pointed out above, the forest reserves have not for their purpose the locking up of the timber, or other resources within them. The first aim of the reserves is to supply for all time the largest quantity of the best timber which can be produced on it. This means that cutting must be regulated as to quantity, and young



Showing the proportion of the prairie provinces reserved for timber production; 14 p.c. for Alberta; 3.97 p.c. for Saskatchewan; 1.75 p.c. for Manitoba. France has reserved for forest production 18 p.c.; Germany, 25 p.c.; Sweden, 47 p.c.



An experiment in Northern Alberta in clearing lands by controlled fires. This was conducted last Spring by the Dominion Government, wide fire guards being first prepared.



The same area as above after the fire died down. It is claimed that the soil was undamaged and that the land can be made fit for farming at a saving of 80 p.c. in costs of clearing. The work was directed by Fred V. Seibert. Look for special article in the May issue.

trees must be encouraged to replace the old. Another important function of the reserves is to conserve water supply. Forests do this by retaining the rainfall and letting it flow off gradually. The ground within a forest acts as a sponge which permits the rain and melted snow to slowly find its way to the creeks and streams, instead of running off all at once, being wasted and causing floods.

It is the desire of the forest administration to develop all uses of the reserves to the full. Settlers are permitted, for a nominal fee, to take timber required for their own use and to graze their cattle on open areas also available for camping, fishing with the reserve. The reserves are and other recreation purposes.

Prohibiting altogether the cutting in a forest reserve would be very poor economy. Trees are not everlasting. Like humans they grow up, mature, and finally die. Better, therefore, to use them while they can best be put to use. By removing the mature trees we make room for the young vigorous trees to take their place.

#### How Reserves Are Planned.

The Dominion Forest Reserves covered, approximately, 43,750 square miles, an area twice that of the province of Nova Scotia, or over half that of Manitoba, prior to 1912. These reserves lie in the three prairie provinces and in the railway belt of British Columbia. The Dominion Government also maintains a free patrol service over many hundreds of square miles of forest not yet included in reservations. Before any areas are included in reserves they are covered by surveys by trained men, to ascertain the character of the country from a forester's point of view. A belt of country from the east to the west of the provinces of Manitoba, Saskatchewan and Alberta, comprising in all 145,000 square miles of the northern parts of these provinces has been surveyed. In some respects the survey has been a disappointment for

a comparatively small proportion of the area is found to be covered with timber of any size. Much of it has in the past been badly damaged by fire.

At present, and for some time to come, the development of the forest reserves has meant, and will mean, the expenditure of a large amount of money with only small returns. Roads and trails have to be built so that the products may be taken out and that all parts of the reserve may be accessible in case of fire. Houses must be built for the rangers and head-phones must be provided to keep the supervisors in touch with their men. All this work requires years to carry out. However, it has been the experience of countries which have introduced scientific forestry that all expenditure is amply justified.

Indeed, in the present stage, the forests of Western Canada are far from being a "gold mine" to the Dominion Government. The Forestry Branch expends annually in Manitoba venue; in Saskatchewan it spends \$145,000, and gets \$9,000 revenue; in Alberta it spends \$200,000, and gets \$18,000 revenue.

#### A European Comparison.

The area of forest reserves in the prairie provinces may look large but compared with most European countries the area of the provinces occupied by reserves is small. Belgium, perhaps the most thoroughly cultivated country in the world, has nearly one-fifth of its area in permanent forests. France has about the same proportion. Compare this with Saskatchewan's five per cent., Manitoba's 1.66 per cent., and Alberta's 10 per cent. Even British India, one of the most densely populated countries in the world, where forestry has been practiced for half a century, has about one-seventh of its area in forests.

The returns per acre from managed forests are much greater than from

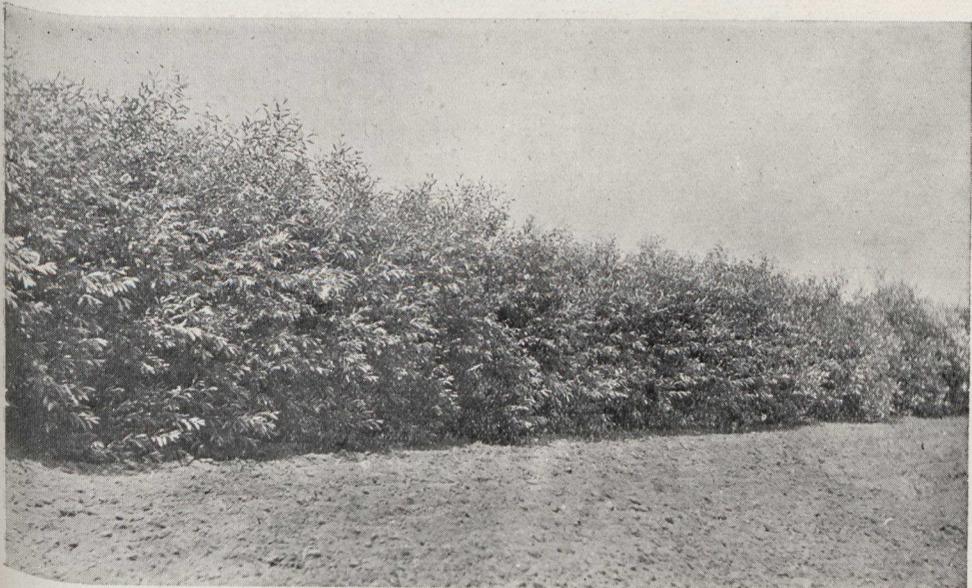
natural forests. The longer an area is kept under forest management the better the return. In Switzerland there are forests which have been under management for four centuries and they yield a net revenue of \$6.20 per acre per year, or at the rate of \$992 per quarter-section.

### Fire Patrol Comes First.

The first step in getting the Dominion forest reserves in shape for actual administration under somewhat intensive forestry practice, was the institution of a system of patrol by rangers. The secret of success of such patrols lies not so much in the actual fighting of fires as in the prevention of fires and putting them out while still small. A large percentage of the fires are started by campers, not deliberately, but through carelessness. They leave camp fires without extinguishing them. The fires smoulder for a time, then break out and consume many acres of timber. It is the forest duty to remind campers to put out their fires and to post warning notices. The ranger also gets in touch with settlers and warns them of the danger of clearing by fire during the dry season. If the

ranger discovers a fire on his beat he puts it out, or if this is an impossible task to perform alone he summons such help as is available. The telephone has been found a wonderful aid in summoning assistance, but this is not enough. Therefore we must have trails and roads in order to ensure quick travel from one part of the reserve to another. These roads also serve as an excellent place from which to fight a fire which is retarded when it strikes a strip of earth clear of growth. Lookout towers set on hill tops at various places throughout the forest are also a great aid. From their tops a view can be obtained over miles of territory, and the column of smoke which marks a fire can be located.

All these trails, roads, lookout towers and telephones are preliminary steps in forest management. The foresters aim is to get his forest in such shape that a crop of timber can be taken off year after year and still enough timber can be left to provide for similar crops year after year for all time. Young growth must be coming on all the time to replace the trees removed. To secure this repro-



A dense shelter belt on the Brooks' Demonstration Farm, Southern Saskatchewan.

duction, as the forester calls it, is one of his first cares. Cutting must be regulated and conducted in such a manner that young trees will not be injured unnecessarily. If young trees are not already present in sufficiently abundant numbers, older trees of the right kind must be left to seed up the area. In some cases it may not be advisable to depend upon this natural seeding. It may be best to gather seed elsewhere and sow these areas artificially. Or conditions may be such that it is advisable to grow the young trees from seed in a nursery and set them out while still very tiny.

### Can We Do As Well?

The forests of Canada are far from the ideal state. They have been sadly neglected and abused, but perhaps not more so than, in former times, were the forests of many of the European countries. Indeed, a hundred years ago in some of the countries that today have attained the foremost place in European forestry, the forests were little, if any, better than ours are now. Canadians are becoming awakened to the need of caring for their forests, and they can apply to their forests the accumulated experience of the last century in Europe, as adapted to conditions on us, with these as well as with our other natural resources, is to get the very best possible use out of them whether the use be for the supply of timber, the protection of water supply, the providing of recreation or for the many minor uses for which the forests may be of service. For all of these the forests will continue to be of use. The forests are here to stay, and the sensible thing, the provident thing, the patriotic thing to do, is to take care of them and they will amply repay the care we bestow on them.

### A GOOD WORD FROM WINNIPEG.

"We wish again to express our appreciation of the great work that is

being done by your organization."

Western Retail Lumbermen's Assn.

F. H. Lamar, Sec.-Treas.

### SEAPLANE FOR PRICE BROS

A large seaplane will shortly be shipped from Vancouver to Price Bros., of Quebec., where it is expected it will be used in connection with the timber operations of that company. The seaplane is being built by Hoffer Bros., and has a 42 ft. spread and a passenger capacity of two. It is considerably larger than the flying boat which was built by the same company for the B. C. government. The plane will have a Curtiss 100 H.P. engine.

### RECORD PRICES FOR TIMBER.

Prices unheard of in the history of lumbering are being paid to the British Columbia Government for fir and cedar timber. A sale which probably holds the record for all time was made recently when timber rights on 225 acres of land at Ramsay Arm, situated on Tidewater, at a point 130 miles north of Vancouver, were sold for \$36,000. In this case the figuring was done on a stumpage basis of \$5.30 per thousand feet for cedar, and \$4.10 for fir. The net return to the government will be \$160 per acre. Added to the high prices the mills are getting the benefit of approximately fifteen per cent. exchange on shipments to the United States, where nearly half the British Columbia cut has lately found a market. The volume of business in timber can be guessed from the fact that the Government sales of standing timber are now approximately three-quarter million dollars weekly.

(Pacific Coast Lumberman.)

# Canada's Job in Handling Forests

by Dr. C. D. Howe

Acting Dean, Faculty of Forestry, University of Toronto

## A Keen and Accurate View of a Pressing National Problem



The land area of Canada is approximately 3.5 million square miles. Our first point to consider is what proportion of this enormous extent of country is covered with trees and what proportion of the tree covered area is today actually bearing saw logs or pulpwood. By referring to the map, we first notice the area in the far north designated as Barren Lands. This area includes at least one half million square miles, a region in which the climatic conditions are too inhospitable for trees, and often even for the more lowly plants.

South of the Barren Lands there is a very sparsely wooded transcontinental belt containing about 700,000 square miles. This is the "Little Stick region," with real trees only along the water courses. It will never materially contribute to our supply of saw logs or pulpwood, although the scattered local patches of forest will always be valuable to explorers, fur traders, and we hope some day to the mining interests which may develop there. This is the region also that we hope some day may be covered with flowing herds of reindeer. Let me say in passing that no one is more interested in the proposal to raise reindeer in this region than the forester.

The fundamental conception of his profession is that every acre of land should be producing something of value, and only the crop to which it is best adapted. A forester does not wish any area to be covered with trees, if it will give a better financial return to its owner in some other crop. There is no antagonism between the forester and the farmer. The forester begins where the farmer leaves off. The slogan of the forester is: Make the loafing acre work.



The dark section roughly approximates the area of commercially-valuable timber in the Dominion.

As you know, the western part of the Dominion is mountainous. It is so mountainous that at least 200,000 square miles are above tree line—too cold and too high for trees. As you also know, the prairie-plains region of Canada covers about 200,000 square miles. We don't know just why this region is treeless. There are many opinions, but very little exact knowledge on the subject. Since, however, this great area is on the whole agricultural, or at least capable of becoming agricultural, the forester rejoices that it is treeless.

### Our Barren Lands.

If we add these areas of treeless regions, as given above, we find that 1,600,000 square miles are incapable of producing commercial forests. Over 40 per cent of the land area of Canada is either too cold, too high, or too dry to produce saw logs or even pulpwood. This is a fact that is

overlooked by those who talk boastingly of inexhaustible forest supplies.

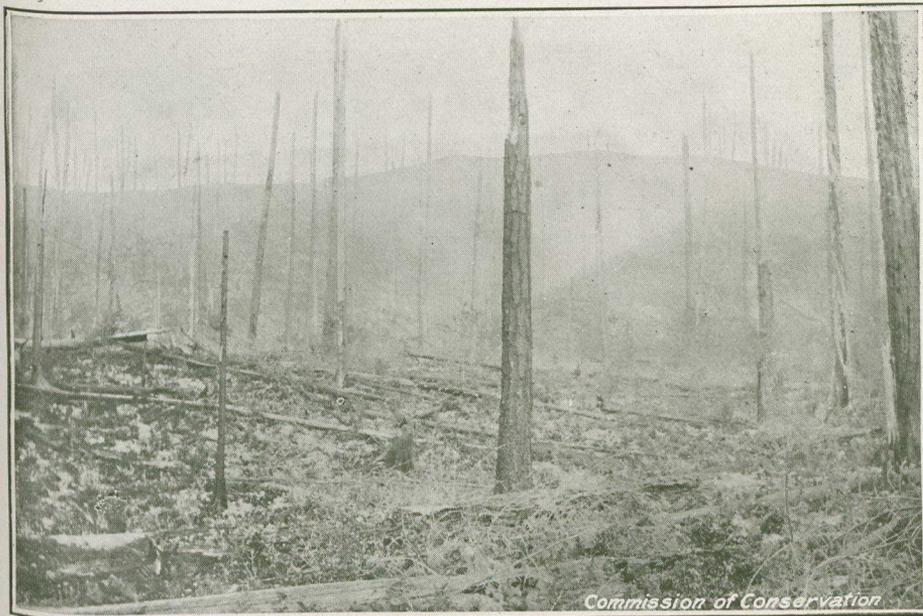
Subtracting the treeless areas from the total land area, we get 1,900,000 square miles of forested country. So you see we have an enormous area of tree covered land. Let us now examine these areas to find what they will yield in terms of saw log and pulpwood material. They may be covered with trees, but are they covered with commercially valuable trees? I shall answer that question by saying that from one half to two thirds of our forests have been destroyed by fire in the past 75 years. It takes twice that length of time in the average forest conditions to make a spruce saw log, that is a tree twelve inches in diameter. In other words forest fires have destroyed the saw logs on over 1,000,000 square miles of good Canadian territory. Ninety per cent. of those fires were caused by sheer carelessness. We are already beginning to feel the pinch of the diminishing supply of accessible timber. You will more readily comprehend what the destruction by past fires means when I say that the loss is equivalent to about 450 years' supply at our present rate of consumption of four billion board feet a year. Let me emphasize the point in another way. All the destroyed timber was on Crown land, land that belongs to the people and from which the people collect a tax when the timber is cut. The smallest tax collected by any government, Dominion or Provincial, is 50 cents per thousand board feet. It runs from that up to \$2.50 per thousand feet. If we apply the lowest rate to the amount of timber destroyed by fire, we find that the public treasury has lost around one thousand million dollars in potential royalties alone.

I am bearing down hard on the significance of forest devastation by fire because, although I have spoken of it in the past tense, it is not in the past; it still continues; it not only continues, but in the past ten years the rate of destruction has probably increased. Every acre of accessible

timber burned on Crown lands makes it harder for you and me to live. It means a loss of public revenue from a source nature gave us free of charge. This loss has to be replaced by taxation, either direct or indirect, and you and I eventually have to pay it.

### Trained Fire Fighters.

It is not my purpose to discuss the forest fire problem at this time, but I wish to say this. Our forests now in charge of governmental bureaus will never be made reasonably safe from destruction until more time and thought, more money and energy are put into the development of the technique of fire fighting. Fighting fires in the bush requires specially trained men and special machinery, just as does the fighting of fires in the city of Toronto. Merely sending a large number of men into the woods each summer as patrolmen, will never be an entirely efficient method. Such men can fight only the one-man or two-man fire, and it is only a few minutes that a fire remains such. Means must be provided to get a crew of fire fighters quickly on the spot. This involves the making of roads, trails, the cleaning out of canoe routes and the building of telephone lines. Hard, expensive, non-spectacular work, but fundamental in any efficient system of forest fire fighting. Already the methods of detecting fires are developed far ahead of methods of fighting. The lookout tower on a mountain top fails to be efficient if there are no means of sending men to the fire which it has reported. The aeroplane may detect many fires in a few hours, but the knowledge of their existence has little value unless there are means of quick transportation of men to the fire. The lookout towers, the aeroplanes, are of spectacular interest and excite the public fancy—but they do not extinguish forest fires. They are only auxiliaries in a fire-fighting system, and they can be efficient auxiliaries only when the groundwork is completed. It will cost money to develop transportation systems for



**BURNED SEVERAL TIMES. PLANTING IS THE REMEDY.**

The reproduction of trees which followed this first fire has been killed. No seed trees are left to make another crop. Planting is the only method by which the commercial forest can be re-established on areas such as this.



**THIS AREA HAD 2,000 YOUNG TREES AT ONE TIME.**

Now it has only 20 living trees. The green forest, shown dimly in the background, is too far away to re-establish the forest on this area by seeding.

the fire fighters in the forest, and the consumer of forest products will pay the cost.

### Our Man-Made Deserts.

At least one half, and probably very much more, of our commercial forest bearing area has been burned in the past three-quarters of a century, and consequently does not now contain timber of saw log size. This is a very deplorable fact. Nature, however, is a great restorer; in time she heals all wounds. So in time she might recover those 1,000,000 square miles of burned country with commercial trees. She often begins the process, but man interferes by allowing the young trees to be burned. Nature tries again, but man the second time kills the young trees she has sown, and so on repeatedly. Man has out-Pharaohed Pharaoh in his treatment of the forest. He has killed not only the first born, but the second, third, fourth and successive generations of young commercial trees. I know areas in the Ontario pneries that have been burned thirteen times in the past fifty years. There are thousands of square miles of one time productive forest lands in Canada which are being gradually transformed into man-made deserts from the standpoint of commercial species through the agency of repeated fires. This state of affairs is little known or appreciated by the general public. They think so long as non-agricultural land is covered with trees all is well, when as a matter of fact the country is growing poorer all the time if commercially valuable trees are replaced by trees of inferior market value, as always happens in the case of repeated forest fires. The chief object of a forester is to cover non-agricultural lands—and to keep them covered—with the largest quantity of the highest priced trees possible. That is only another way of saying that a forester is a business man who is trying to get the largest and longest continued financial return possible from the capital his employer has invested in the land.

Let us come back to the classification of forest lands. We have found that one half commercial forested area does not at this time contain saw logs because of destruction by forest fires. By saw logs I mean trees 12 inches or over in diameter. How much we can depend on the extensive burned areas for the future supply of commercial trees unfortunately we don't know at the present time. So far as area goes, one half our future supply should come from these burned-over lands. So far as our knowledge does go, however, the outlook is not very encouraging for such reports as we have indicate that about one-third to one-half the burned over lands are not reproducing the valuable species in potentially commercial quantities. A careful survey of conditions and study of the rate of growth on the old burns is imperatively demanded before we can make any reasonable prophecy as to the future supply of timber—in eastern Canada especially. Such work has already been initiated on a small scale by the Dominion Forestry Branch, the Commission of Conservation at Ottawa, and by your own Provincial Forest Branch. It is earnestly hoped that funds may be supplied for the immediate and continued extension of such investigations.

Subtracting the 1,000,000 square miles of burned forest lands from the total forested area, we find there are 900,000 square miles of unburned forest in Canada. More than half this great area, or about 500,000 square miles, does not contain much saw timber (trees larger than 12 inches in diameter), but probably enormous quantities of pulpwood. I refer to the Ungava-Hudson Bay drainage region. Large trees are found only along the stream courses and on the flats around lakes. On the upland areas the trees run from six to eight inches in diameter on the average, and they are full grown, in fact over 100 years old.

Continuing our deductions, we find that we possess only about 400,000

square miles of forest capable of producing saw logs, trees at least 12 inches in diameter, or territory equivalent to about one-eighth the total land area of Canada. As you know, this area occurs in two great blocks at the two extremes of the country, one in the east, the other in the west, and they are about the same size, namely 200,000 square miles each.

### The West as a Future Supply.

In considering the present condition of these saw log bearing areas, let us begin in the West. The Commission of Conservation at Ottawa has recently completed a survey of British Columbia's forest resources. It was found among other things that the timber on two-thirds of the forested area has been destroyed by fire. The loss by fire in British Columbia alone is nearly equivalent to the estimated amount now standing in the entire Dominion. Yet in spite of this great destruction, British Columbia has today sufficient timber to last her nearly 300 years at her present rate of consumption. If it were accessible the supply of the whole Dominion at its present production could come from British Columbia for the next 70 years. In addition to this British Columbia is estimated to contain sufficient pulpwood material to furnish the present annual output of the Dominion for more than 50 years. The West may be our savior in timber supplies. Such supplies are a long distance away; the transportation charges will be high. It may be, however, that the public in the eastern provinces will pay such heavy charges in preference to being bothered with the care of their forests at home. If we should, in the future, draw heavily on western supplies, we should always remember that a small portion of the freight charge on each thousand feet of lumber from British Columbia reinvested to promote new growth in the forests at our doors would have rendered them continuously productive of saw logs for all time.

### What of the Prairie Provinces?

Coming eastward, we find that the forest resources of Alberta have not been determined. We do know, however, that around three-fourths of the entire east slope of the Rocky Mountains has been burned within the past 50 years, thus so far as relative area is concerned the saw log producing forests are limited. The young growth, however, is reported to be coming on vigorously, and it is a valuable asset. In crossing the region north of the prairies in Saskatchewan and Manitoba, we would find less than one per cent. of the trees larger than eight inches in diameter—partly due to fires and partly due to climatic and soil conditions. We usually do not think of timber in connection with the prairie provinces, yet Saskatchewan cut nearly 90 million feet of boards, Manitoba over 50 million, and Alberta more than 33 million feet in 1917.

I trust I shall offend no one when I say that we have no very reliable estimates of the quantities of commercial timber in Ontario, although there have been many guesses. These guesses are based on the estimated forest area and the estimated yield per acre. They can be made in any office with the aid of a map and pencil. Ontario has about 10,000,000 acres under timber license and practically the same area in pulpwood concessions. The province also holds about seven million acres in forest reserves. A guess of the standing pine, Ontario's principal lumber product, made ten years ago, was equivalent to forty years' supply at the then rate of cutting. Statistics of production show that the output of white pine has decreased by more than one-third in the past twenty years. This means that the cut is 400,000,000 feet less than at that time. At \$2.00 per thousand royalty, it also means a decrease in revenue from pine of \$800,000 in the past twenty years. Taken at their apparent value, the statistics of provincial revenues, however, show no decrease. But if one examines the

figures, he will see that the apparent revenues are maintained not by the collection of royalties, but by selling stumpage, that is, by reducing the capital stock. Unless the forests of Ontario are growing faster than we believe they are, we are becoming poorer each year by such treatment. When we consider the enormous destruction by fire of standing timber and especially the young growth, the destruction by windfall and insect diseases, and the apparent deficiency of natural regeneration on unburned cut-over lands, it seems apparent to us that we are constantly reducing our forest capital, but I must confess that we have not as yet sufficient statistical data as the result of investigation and research to make such a statement as a scientific fact. The Commission of Conservation at Ottawa at the present time is making a survey of the forest resources of Ontario. This work will probably last about five years. At the end of that time we will know more about our own conditions than we do at present.

The Forest Service of the province of Quebec also is gradually acquiring data with regard to the forest resources of that province. The province of New Brunswick is making a very detailed survey of its resources. This will be completed within a few years. Now, the province of New Brunswick is also, in co-operation with the Commission of Conservation at Ottawa, making a systematic study of the rate of growth of the forests. When the province knows by actual measurements just how much timber it has and how fast it is growing it will be able to practise forestry; which means, in general, the taking from the forest each year only an amount equivalent to the annual growth and leaving the forest capital to continue that growth indefinitely, as it will do if protected from fire and from disease.

#### Our Capital Stock Declining.

I have already referred to the fact that the destruction of forest capital by repeated fires has been so great

that it is probable that it, in combination with the amount of material taken away by logging, results in the depletion of the capital stock. For several years I have been engaged in the study of the amount of young material and its rate of growth on cut-over, unburned pulpwood lands in Ontario, Quebec and New Brunswick. The studies have been made in the mixed forest type, hardwoods associated with spruce and balsam. I find that as a rule in this type there are not nearly as many young spruce trees to make the future crop as has been taken away by logging operations. The usual condition is about one-third as many. I find also that these areas which have been cut-over several times in the past forty years are accumulating spruce wood at a much slower rate than it is being cut. On the average as much spruce has been cut in the past forty years as it has taken nature about 250 years to produce. In other words, the annual growth in the past forty years has been only about one-sixth as great as the harvest. These results apply only to a definite type in definite river valleys. We do not know whether they are representative of the conditions in the whole of eastern Canada. It is very important that we should know, and only until such studies have become much more extensive than they now are can we predict with reasonable accuracy the duration of our forest resources based on the present annual consumption.

#### What Lies Ahead?

Owing to recent discussions of the subject in the press, I suppose you would be much interested to know how long the supply of pulpwood in our eastern forests will last at the present rate, or at the expected increase in the rate, of consumption. Estimates have been made which extend all the way from 15 years to 1,000 years. About 30 years ago a prominent lumberman predicted that the timber supply of eastern Canada would not last twenty-five years — and we still have some timber left.

Yet his prediction came true. Using the standard of his time, he was right. In those days they were cutting trees two feet in diameter. It apparently did not occur to him that the use of smaller trees would become profitable.

If we were today dependent upon trees two feet in diameter for our timber or pulpwood supplies we would be facing a famine. Except in protected places, softwood trees of that size are gone from the forests—and they will never return. There are very few areas of commercial timber lands in the St. Lawrence drainage basin and in the Maritime Provinces that have not been cut over at least once—most of them several times, and some of them five or six times in the past 60 years, and each time smaller trees and more inferior material were taken. Rising prices of lumber made this possible. The higher the price of lumber, the closer the utilization of the forest. Trees too small to be utilized today, may, and in all probability will, be used 10 or 20 years from now. Estimates as to the continuance of the spruce pulpwood supply are usually based on trees 12 inches or more in diameter, for this is the diameter limit below which spruce trees may not be legally cut in Quebec, where the pulp and paper industry is centered. Personally, I believe that the supply of spruce trees of that class will not last very much longer at the present rate of increase in pulpwood production in eastern Canada. In fact, the diminishing of the supply has already begun. When the shortage of spruce trees over 12 inches in diameter becomes acute, there will be at least three courses open to the pulp and paper companies. They may bring pressure to bear to get the 12 inch diameter limit removed so they can utilize the smaller spruce trees in the forest, or they may substitute other woods for spruce. The latter process has already begun since increasingly larger quantities of balsam are used each year. Owing to its susceptibility to disease, however, it is probable that balsam cannot be depended upon

to a great extent for future supply. Woods not now extensively used may be pressed into service, such as poplar and birch. Enormous quantities of these species, as yet practically untouched, are to be found in eastern Canada. The making of pulp from poplar requires a different process from that of birch, and each in turn a different process from that of spruce. So if the hardwoods were used instead of spruce, the pulp mills would have to be reorganized, new machinery installed and new processes established. This would be expensive, but it would be done if necessary—and the consumer of pulp products would pay the cost.

### Hudson Bay Prospects.

The other alternative before the pulp companies when the supply of 12 inch spruce gives out, would be to move northward into the Hudson Bay region and utilize the small, undersized spruce to be found in the north country, where thousands of square miles are covered with spruce from four to eight inches in diameter. It has attained full growth; it will never be any larger and might as well be cut. As you know, the northward migration of pulp and paper mills has already begun. I believe it will continue. I believe the next generation will see the center of the spruce pulpwood industry on Hudson Bay waters instead of on St. Lawrence waters. The manufacturing costs will be high, the transportation charges will be heavy—and the consumer will foot the bills.

### Costs Must Keep Rising.

The lumber industry in Ontario and Quebec began on the shores of the Great Lakes and the St. Lawrence River, and it has been pushed northward ever since. The fact that we have to go farther and farther away from the markets for the supply of our material has been reflected year by year in the increasing prices of lumber. The present high prices of lumber are a response to supply and demand. The chances are that unless we undergo some great indus-

trial crisis, the prices of lumber will never be very much lower, at least, until we attain the adjustments of a stabilized industrial development and that is several generations ahead of us. The demand increases, the supply decreases, the prices go up. What else can you expect? It will cost you more to build your houses in the future. The furniture you put into your houses will cost you more than at present. Your newspapers will cost you more. Everything into which wood products enter will increase in price largely because you have neglected to protect and conserve your great natural forest resources lying on non-agricultural lands, almost at your doors. I say the high prices of lumber are here to stay, and I will also say that they will go still higher unless the public that owns the forests initiate at once recuperative measures. The sooner the great industrial consumers of wood fibre realize this the better. If the newspaper publishers know where their bread is buttered, they will use their columns much more extensively and effectively than they have in the past in the endeavor to convince the public that we cannot wantonly deplete our forest resources without paying the price, and consequently urge methods of handling our forests that will keep them in continuously productive condition.

#### What High Prices Entail.

Personally, although I am a householder, I welcome the coming of high prices of forest products, for on the whole they will work out advantageously to the forest and to the community. The higher the price of lumber, the greater will be the value of our forests, and consequently the greater will be their protection. We protect the things we value. We have destroyed our forests in the past because we held them cheap. We were not sufficiently interested to insist on their protection. We will get the more interested, however, the more we feel the financial pinch of diminishing supplies. The greater their value, the more intensive will be their

cultivation. We cultivate the crops that pay best.

#### Re-invest the Forest Revenues

I trust you will not consider me tinged with red when I assert my belief that the community should share in the increased price of lumber. In British Columbia, for example, when the market value of lumber goes above a certain price agreed upon as furnishing the producer a reasonable profit on his investment, the royalties exacted by the province increase in definite ratio. Thus the people as a whole, profit by the upward trend of prices. I would suggest that a certain portion of such graduated tax be re-invested in the forest by the community to accelerate the regeneration and growth of the commercial species and thus keep our woodlands at our market doors, continuously productive. Most private business is sustained by a re-investment of a certain portion of its profits. The communities' forest business can be sustained only in the same manner. The Dominion Government spends about \$3,000,000 a year for the encouragement of agriculture, which is another way of saying that amount is re-invested in the business of increasing the productivity of the farm soil. The forest soil products have a value equal to that of our wheat crop, yet we are re-investing almost nothing to continue its productivity. The lumber industry created for Canada in 1917 forest products valued at \$116,000,000. The pulp mills of the country produced in the same year materials to the value of \$96,000,000, a total of over \$200,000,000. The lumber and pulpwood industries stand third as producers of wealth in this country, being surpassed only by agriculture and manufacturing. We re-invest a portion of the earnings of agriculture and of manufacturing to keep these industries going, but with the exception of spasmodic planting we have reinvested very little of the forest revenues to encourage the regeneration of the present commercial species. We must do this. We must re-invest a certain

portion of our timber and pulpwood revenues in the promotion of new growth if we would keep our readily accessible forests continuously productive, if we would maintain the continued prosperity of our third largest industry—and that is only an-

other way of saying if we would maintain the continued prosperity of our country.

(An address delivered before the Royal Canadian Institute, Toronto, March, 1920.)

## The Date Palms of Mesopotamia

by C. B. Gill, Forest Assistant, Dauphin, Man.

(late with the British Forces in the Far East)

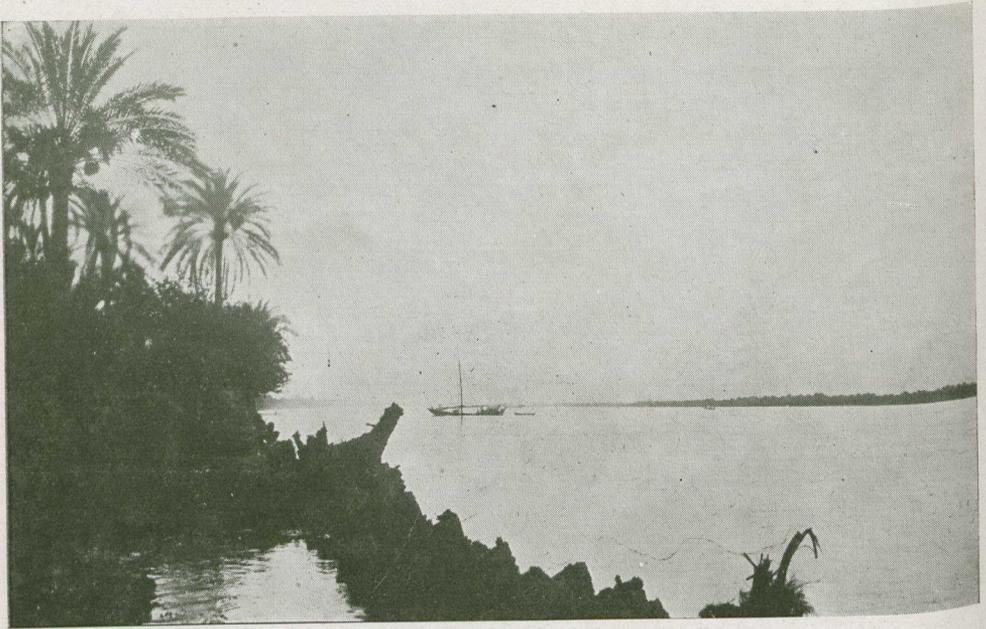


Outside the citadel gate at Baghdad.

When twenty-seven days out from Devonport the first glimpse of the green strip of date plantations along the Shatt-el-Arab is a refreshing sight. We had lounged for twelve burning days on the ironclad deck of our tramp steamer since we left the coolness of the Mediterranean, and adventured into the Red Sea and the Persian Gulf. From our vantage point on deck we saw over the tops of the date palms and realized that only a mile back, or in some cases, only a few hundred yards stretched a vast, flat, whitey-gray desert, shimmering to the vague horizon.

Date growing is one of the few industries which Turkish misrule has

allowed the Arab to make a success of. 80,000 tons of dates were exported yearly before the war. The plantations extend in a narrow belt along the river from the Gulf to Kurna (the Garden of Eden of the British Tommy). From Kurna to Amara marsh lands intervene, but at Amara some fine plantations occur. Beyond Amara only a few small groves mark the site of the riverside towns until Baghdad is reached, and there perhaps a dozen miles of date plantations interspersed with orange groves, skirt the banks of the Tigris. On the Euphrates small plantations occur at Ramadie, Hit and Anah, but beyond the last place (the only beautiful



The famous Shatt-el-Arab, Mesopotamia.

town in Mesopotamia), the fig, the the almond, the plum and the apricot of more temperate regions take the place of the date.

#### Water Raising Devices.

The zone of maximum development for the date centres at Basrah and Mohammerah. The reason for this lies primarily in the higher temperatures which occur here, and secondarily in the greater ease of irrigation, due to the lowness of the river banks. As the Arab proverb says, the date must have "its feet in water and its head in fire." The trees are spaced about twelve feet by twelve feet, and between every second row runs a ditch, which terminates at the river. As the tide rises the fresh water of the river is forced ahead of it into the irrigation canals and minor ditches, but when it subsides the fresh water can be kept in the ditches by closing the water-gates at their lower ends. On the higher reaches of the river water has to be raised into the ditches by donkey-power, operating various contrivances of wooden pulleys and sheepskin buckets. On the rock-

bound Euphrates beyond Hit, great water wheels perhaps thirty feet in diameter, are turned by the current and raise the water in numerous earthen pitchers fastened to their outer margin.

#### 16 Cents Tax Per Tree.

The otherwise ignorant river Arab is a technically trained man when it comes to date culture. Some sixty varieties are known, differing very slightly from one another, mostly in the fruit. The Arab does not trust to nature for a crop; hand fertilization must be practised. Male trees are about one to every eight female. In March, when the flowers appear in the centre of the new crop of fronds, the male flowers at a certain stage are broken off and tied with a whip of grass in a reverse position over the female flowers. Here they are left until the male flowers have shrivelled up and pollination has taken place.

During the hot summer the date clusters turn from green to yellow, and in September to a deep brown. Then is the harvest season. The Arab girds his skirts around his loins and

ascends the tree with his basket on his back, leaning back against his belt like a lineman climbing a telephone pole. As much as a hundred pounds of fruit is obtained from a single tree, and as it takes a tree about ten years from planting before it produces a full crop, from when it bears for perhaps a hundred years, it can be readily seen that a tree once producing is very valuable. Each tree pays the British Government a tax of eight annas (sixteen cents), while any tree destroyed in camp construction is paid for.

### How Date Trees Are Used.

The date furnishes the concentrated food of the desert traveller in much the same degree as bacon and flour supply our woodland wanderers. All the ancient caravan trails are strewn with the date stones of the past. But the date tree supplies stimulant as well as food. The "arack" of the East is distilled from fermented date juice, and although the Prophet forbade the use of wine, it would seem from the gait of some of his followers during the feast of the Ramazan that the rule was not strictly enforced. The triangular base of the frond is used for fire-wood, while the mid-rib is split into strips which make an excellent framework for a bed. The fibre around the base of the frond is spun into rope. The bole of the tree itself, although not what we would call timber, was largely used by the army in the absence of other trees, in the building of bridges and wharfs.

### SAFETY IN THE AIR.

Since the war, Mr. Handley Page, recently visiting in Canada, has been developing the commercial side of aviation, and is planning enterprises in three or four continents. Regular services have been established between London and Paris, and London and Brussels. Mr. Page could boast with pardonable pride that on these routes his machines had flown 65,000 miles and carried 4,200 passengers

and 49,000 pounds of freight up to March 1 without a single mishap. He thinks Canada is a favorable field for commercial aviation, because of its great distances and its comparative freedom from fog and the other varieties of weather which hamper flying in Great Britain. He suggests that the aeroplane would be invaluable for forest patrol and railway surveys in new districts. On the superiority of private enterprise over State control in a business in which technical advances are so rapid, Mr. Page is emphatic.

"Canadian youth in the air service won a heritage of glory for the Dominion," observes the Toronto Globe. "The number of Canadian air pilots in the war, 11,000 or one for every 800 of the population, is a record unequalled. Mr. Page handsomely acknowledges the vital part played by this country in winning for the Empire supremacy in the air, and his own obligation to Canadian aviators. If commercial aviation has a future in the Dominion, as Mr. Page thinks it has, it will have a great body of special skill to draw upon.

### THE CAUSE

(Douglas Malloch, the Lumberman Poet.)

There's something wrong about our times:

Some money madness fills our veins;  
Now each upon his brother climbs—

The more he climbs, the more complains.

The worker wins a higher wage,

To pay some other wage as high;  
There's something wrong about our age,  
And we who labor wonder why.

What profit any profit if

We do but feed upon ourselves?

Yet we who toil must also live,

For our own need we fill our shelves.

The more we ask the more we pay,

The more we pay the more we ask—

Like squirrels in a cage at play,

The greater speed the greater task.

I am no doctor learned in laws

Of social or of psychic man

But yonder there must be a cause

Where this insanity began.

I think we reap the punishment

Of human folly—when we taught

Success was riches, gold content,

And joy was something to be bought.

## HOW LONG WILL TREE SEED KEEP ITS GERMINATING POWER ?

*Answered for the Forestry Journal by B. R. Morton*

*Dominion Forestry Branch, Ottawa*

With reference to your enquiry regarding the germination of tree seed, I might say that the seed of different species have a wide range in keeping and germination qualities. A number of coniferous and broad-leaved species that mature in the autumn do not, under natural conditions, germinate the following spring, but lie dormant in the ground and germinate one or two years later. Some of the pines and junipers germinate very slowly. The western white pine may lie in the ground for several months before more than a small percentage begins to show. Red cedar requires a year or longer. Honey and yellow locust also lie for a long time. White spruce seed during a dry season will lie over until the second year. Larch is also irregular and may lie over a year. In general, species in which the seed is protected by a thin absorbent covering usually germinate within a few weeks after sowing. Those with thick, hard or leathery covering, such as the nuts, are slower and more irregular. Seed of such species as the white elm, red maple, silver maple, poplars and willow, remain alive but a few weeks after ripening. They mature their seed in the late spring and early summer, and should be sown at once. Other species like the chestnut, hickory, walnut, oak, beech and ash, lose much of their germinating power if dry stored. They should be planted in the fall, or if it is necessary to hold them over until the spring, they should be layered between moist sand. As a rule the drier a seed becomes in storage the longer will germination be delayed after sowing. Nuts dry stored over winter will often live over until the second year when planted. The seed of most coniferous species may be safely dry stored in a cool place.

### REVIVAL OF TOPIARY.

(London Times.)

Topiary, or the art of tree-sculpture, has experienced a great revival during the last thirty years, and many gardens nowadays boast their spirals, pyramids, birds, and so on, grown and cut in yew and box. An expert whose nurseries at Richmond contain some 3,000 picked specimens, states that the trees are very slow growing, and that the best specimens are produced by the patient Dutch, whose soil and climate are very suitable. Trees grown in Holland are quite hardy in this country, and require clipping but once a year. Birds, without base, take about ten or twelve years to grow, and dogs from twelve to twenty years, while other subjects requiring anything from ten to ninety years, include peacocks, serpents and serpentine columns, tables, armchairs, sitting hens, geese and ducks, dogs (with and without kennels), ships, horses and pigs. One man in the north has his crest, a pelican feeding her young, grown in yew.

The subject must be correctly formed, very thick and bushy, and free from decayed wood and leaves. For this reason the trees are only grown from one stem, so that all parts shall be equally nourished.

### MUST PAY FOR TREES.

In a judgment rendered by the First Division of the Court of Review, the Bell Telephone Company of Canada was condemned to pay the Country Club of Montreal \$592.01 damages in compensation for the cutting of a number of trees on their property situated at St. Lambert. This judgment reversed one of the Superior Court, and the Bell Telephone Company was also condemned to pay the costs in two courts.

# Moving Mountains by Co-operation

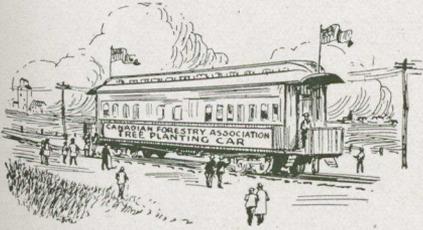
THE Canadian Forestry Association has several new educational enterprises ready to put into action. These are in addition to the ones regularly employed.

Our Children's Lecturer, a special



## NO MAN'S LAND IN CANADA.

This is the thing the Forestry Association helps to prevent.



The Canadian Forestry Association has a Tree Planting Car ready to visit Southern Saskatchewan and Alberta, where the planting of shelter belts means the economic salvation of much of the country. Do you favor this?

OUR Tree Planting Campaign for the southern prairie provinces, is all equipped and ready to start. We have been given a large railway car as a motion pic-

worker for juvenile audiences, has scores of invitations from school boards, boy scouts and Y. M. C. A.'s. Here is an Open Door. Here is offered to us the one rapid method of winning tens of thousands of young Canadians for the cause of forest conservation—a truly national cause.



The distribution of forest protection literature is a potent method of reaching young and old in the districts where fires actually get their start.

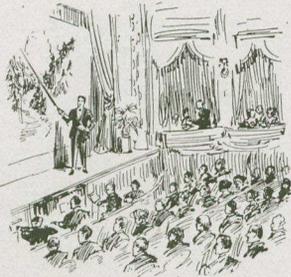


Canadian Forestry Association lecturers have given excellent service in some of the most remote sections of forested country. Education is the modern method of blocking forest conflagrations.

ture and demonstration hall. We have an experienced tree planter and lecturer selected. Co-operation is assured.

But the money that will keep these campaigns moving comes only from the Forestry Association membership fees.

Whether we fulfill our comprehensive 1920 programme depends absolutely upon the volume of fees re-



Scores of public meetings are held by the Canadian Forestry Association in all parts of the Dominion. Motion pictures are freely utilized.

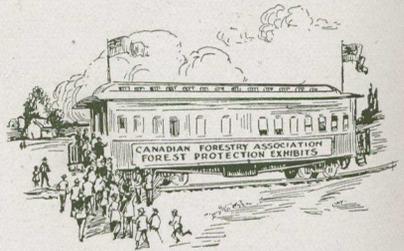
ceived at this office before June 1st. Is your fee held up — until “tomorrow”—until a “handier” time?

The Forestry Association belongs to its members. All the ‘Dividends’ of our work go to the Canadian people.

**T**HIS also is worth remembering: The Forestry Journal costs us a dollar bill for paper and printing alone for your twelve issues.

When a member pays his Journal subscription and an extra dollar for his membership fee, he not only pays his own printing bill, but he puts one dollar into a vital educational task.

June the first is the date we have set to get all the fees into the fold. Today — This Day — is even more timely.



Not forgetting the faithful Forestry Exhibition Car which for three seasons has done sterling service in drawing public attention to forest protection.

## Forest Fires and Canada's Fur Trade

Revillon Freres Trading Company, writing to the Canadian Forestry Association, state: “It is generally accepted as a fact in the north country that many fur bearing animals are destroyed in forest fires and it is certain that the Indians in their hunting operations neglect those parts of the country which have been burned over unless the brule is old.”

Alberta's forest fires in 1919 meant \$2,000,000 in destroyed wood alone.

Saskatchewan lost \$8,000,000 of forest values in last year's fires.

Ontario annually suffers severe forest damage.

200,000 acres in Quebec were burned over in 1919.

What meaning has this for the fur trade of Canada?

“Canada is not only a great fur-consuming country, but is also one of the leading fur-producing countries of the world, and, provided we take proper measures to conserve our wild life, is likely always to remain so.” observes the Commission of Conservation. “Although here, as elsewhere, furs are often worn for ornament, our rigorous winter makes furs almost a necessity for many persons. The farmer who drives many miles to the elevator over the wind-swept prairies appreciates the value of a warm coon-skin, and knows that no covering devised by the ingenuity of man is so effective in excluding the cold as the natural protection with which the wild animals are endowed.

“Before the war, we were import-

ing more furs than we exported. For the fiscal year 1913, our total imports of this commodity amounted to \$7,993,651, and our exports to \$5,415,119, thus leaving an unfavorable balance of over 2½ million dollars. During the war we have had a favorable balance, small at first, but rising to \$9,214,584 for the fiscal year 1919. For that year our exports amounted to \$13,737,621 and our imports to \$4,523,037. The increased value of our exports is largely due to the enormous rise in prices, but also indicates a considerable increase in the number of pelts exported. It is gratifying to note that in spite of the higher prices, our imports have actually decreased in value. This would seem to indicate that there is an increasing domestic consumption of our own furs.

In 1913, our imports from the United States were \$4,228,456, and our exports to it, \$2,343,183, showing a trade balance in favour of the States of \$1,885,273. For the fiscal year ended March 31, 1919, the figures, as given in the annual report of the Department of Trade and Commerce, are: imports, \$3,801,605; exports, \$9,743,464; balance in Canada's favor, \$5,941,859.

Our imports from Great Britain have declined from \$1,294,462 in 1913 to only \$148,456 in 1919. Meanwhile our exports have increased from \$2,795,791 in 1913, to \$3,763,955 in 1919. Taking into consideration the rise in prices, these figures indicate an actual decrease in quantity.

Undressed furs form much the largest item in our exports, over 98 per cent. of the whole, and also about 78 per cent. of the imports.

### TIME FOR ACTION HAS COME.

(St. John, N.B., Telegraph.)

The Toronto Globe is of opinion that Canada can supply her own needs from her forests, and also have a large export trade, without destroying the source of supply. This could only be done by a nation-wide policy of conservation. It is safe to assert that the log cut and pulpwood cut in New Brunswick this year exceeds the forest growth for the year. That is to say, there has been an encroachment upon the permanent wealth in trees, which, if continued from year to year, would eventually wipe out the forests altogether.



Scenes on the Quesnel River, British Columbia.

## The Forest Fire Melody—Who Pays the Piper?

Morden, Manitoba.

In travelling through the length and breadth of Canada, the thing that grips one most, is the appalling destruction on all sides, by forest fires. Travel in whatever province you will, it is the same story; thousands of square miles of virgin forest burned over year after year. So used has the average Canadian become to these conditions that he has looked upon them as a kind of necessary evil. But there is a day of reckoning coming, and coming quicker than most people think. No country was ever blest with a finer forest, naturally, than Canada, but we have squandered it with a recklessness that is nothing short of criminal. And the end is already in sight. We have been using our own share as well as the share of future unborn generations, and now, when the big demand for lumber and all building material is on, there is already a big shortage with prices soaring and no relief in sight. Meanwhile, we allow the forest fires to run merrily on, year after year, burning up millions of acres of mature timber and millions of acres of young growth as well. Strange that any nation in its right mind would allow this thing to continue year after year, especially when the lumber and pulp industry is the second in importance in Canada.

We have millions of acres of non-agricultural land in Canada that should be growing a crop of young timber right now, to take the place of the mature stand when it is gone. In a great many instances nature would reseed these lands if the fires only were kept out, but every fire makes this problem of reseeded more difficult on account of seed trees being killed over wide areas.

I have in mind a tract of land in eastern Manitoba, non-agricultural covered with a heavy growth of spruce, tamarac, poplar and jack pine. I have cut logs in this forest over two feet in diameter. This tract of timber was entirely killed by fire in 1897,

and has been burned off several times since. Today there is not a seed tree left, and the site is to all intents and purposes a desert. This can be duplicated in every province in the Dominion today.

I think what is needed most in Canada today is a campaign of education to show the people the utter folly of allowing this thing to go on. The average Canadian has never given this matter any thought. It is a case of never missing the water till the well runs dry. All power to the Forestry Journal, as it is through independent mediums like this that we must depend to educate the people to needed legislation. It is very seldom indeed, we find a Government in advance of the people.

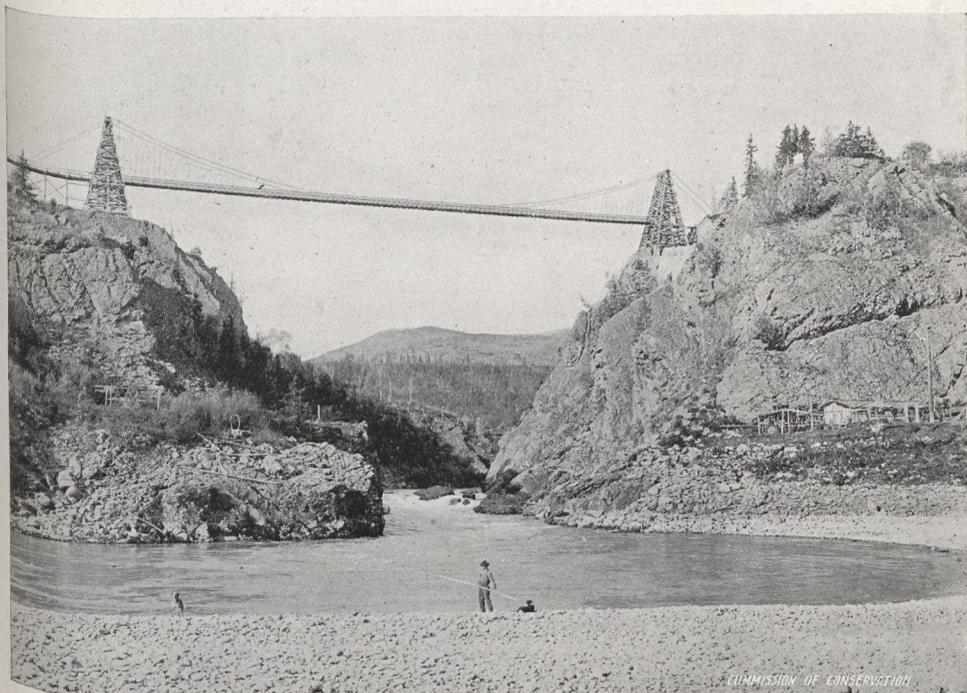
—M. J. STEVENSON.

### SKINS AND TIMBER NET \$168.

London, Ont. — William Elson, a farmer residing near Wingham, felled a huge soft elm tree, and in the top of it was the winter home of a family of raccoons with three lusty youngsters. Mr. Elson cut the tree into three logs and had them sawed into lumber. They yielded 2,804 feet, for which he received \$98.14 at \$33 per thousand. Then the farmer sold the skins of the coons for \$70, making the total amount he realized from the tree and its occupants \$168.14. Mr. Elson feels he has established a record for high finance in furs and lumber.

Please send in your membership fee promptly.

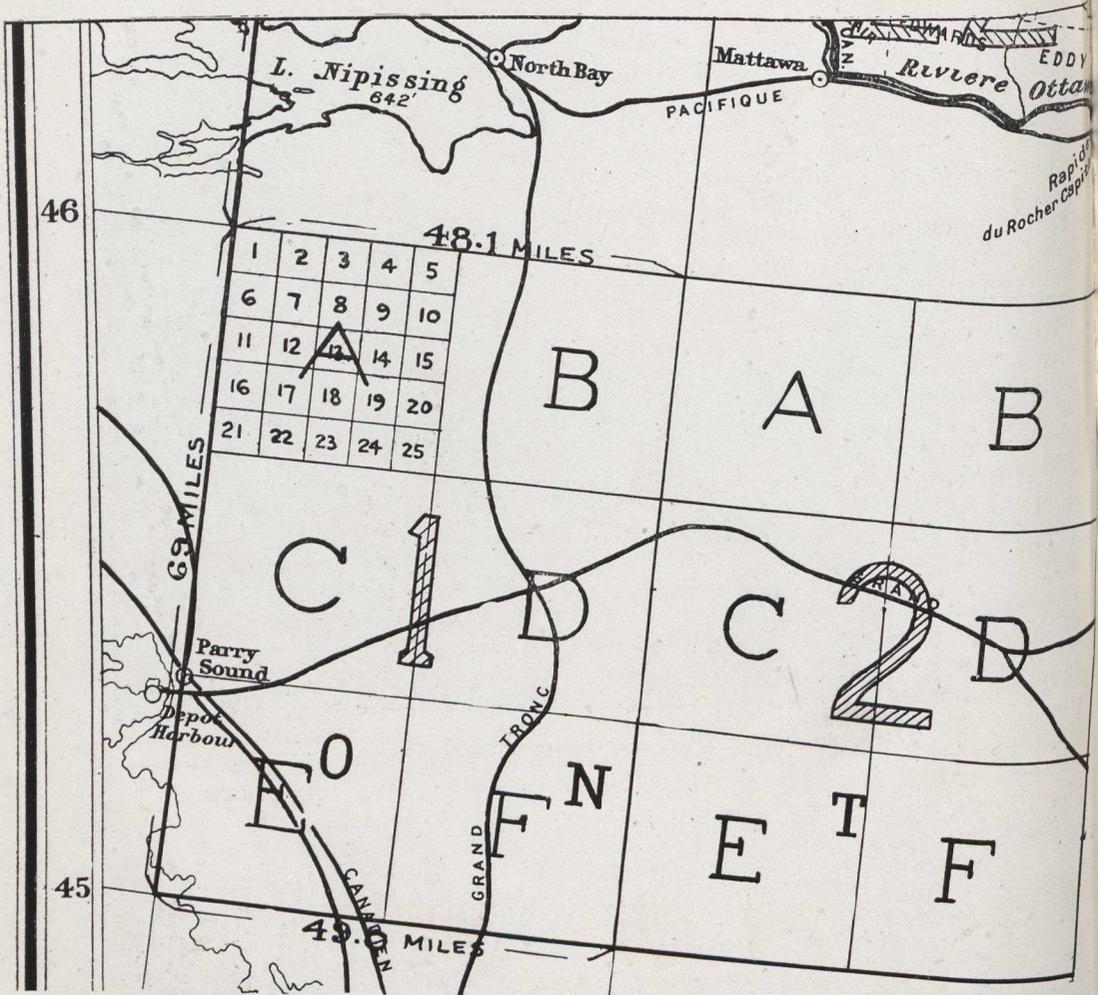
The members are responding splendidly to our new plan of a Two-dollar Annual Fee, including subscription to the Forestry Journal.



Along the Bulkley River, near Hazelton, British Columbia..



On the Skeena River, British Columbia, head of Kitsalas Canon.



## A New Reference Map for Aerial Purposes

(by Stuart Graham, R.A.F.)

The fact that many lakes, rivers and towns frequently bear the same name has long been a source of confusion in various parts of Canada, and as the rate of transit increases, this becomes more troublesome. Now that aviation promises to be one of the most important assets in the development of the country, it is necessary to utilize some method whereby rapid and accurate reference may

be made to any desired position or point. The carrying out of aerial work over the St. Maurice Valley during 1919 necessitated the adoption of such an idea, but this was more of a local nature.

For aerial photographic surveys, and the reporting of forest fires, it is absolutely essential that a generally accepted map covering a large area be utilised, and yet this map must

permit of rapidly designating an exceedingly small area.

Various methods of rapid reference by 'map squaring' were used by all the belligerent countries during the war, but the areas dealt with were seldom as extensive as those which confront us in Canada. An index system covering the whole universe was drawn up by an International Conference some years ago, and although this will probably be used by all countries for long distance aerial transportation work, it is entirely unsuitable for "intensive" aviation such as is being inaugurated in the Province of Quebec, chiefly by the pulp and paper industry.

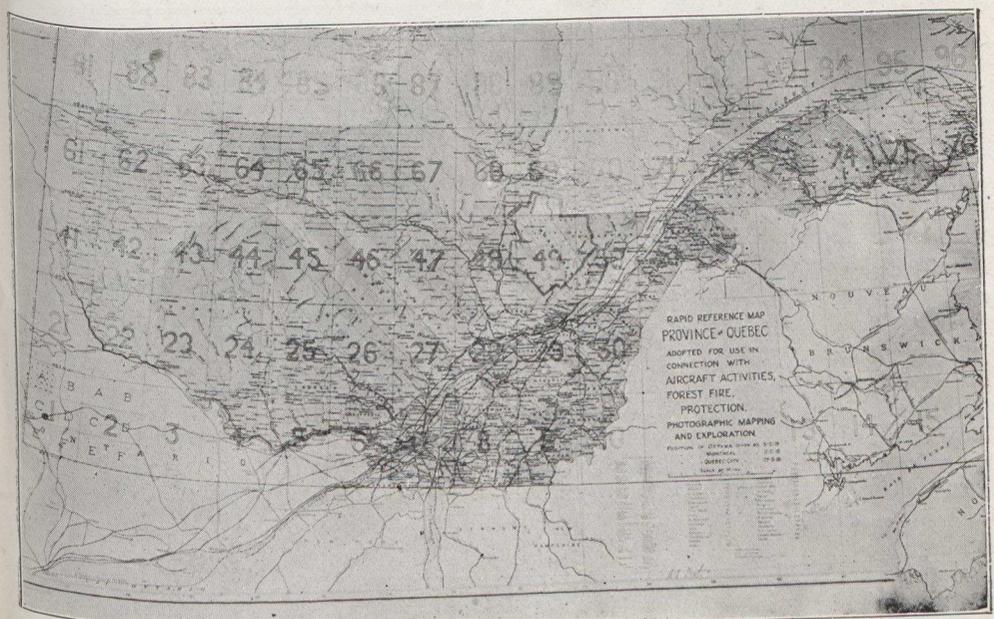
**How the System Works Out.**

The system illustrated concerns mainly the Province of Quebec. The area contained between the parallels 45°N and 52°N, and the meridians 60°W and 80°W, has been taken as that embodying all the territory in the province of interest to aviation. Beginning at the south-west corner of this territory, areas contained between degrees of latitude and longi-

tude are numbered from west to east, and in consecutive rows northwards, notation being from 1 to 140 for the complete territory. The degrees of longitude are then divided into two equal parts, measuring along the parallels; and the degrees of latitude are divided into three equal parts measuring along the meridians. This divides each of the spaces enclosed by a degree of latitude and longitude into six parts which are designated by the letters A, B, C, D, E, and F, in each degree. Each of these lettered divisions is sub-divided into twenty-five parts, which are measured from 1 to 25. By referring to the illustration it will be seen that the position of Ottawa would be given as 5 C 19. This refers to an area about five miles square, which is accurate enough for most purposes.

**Finer Sub-divisions.**

An even finer division, not shown in the illustration, has frequently to be used on large scale maps where accuracy of location is necessary, as



How the province of Quebec would look to the flying man, equipped with the reference map.

in aerial photography. This has been done by dividing the smaller squares illustrated, again into twenty-five squares designated by the letters a to z (omitting the 'i'). This division provides an area slightly less than a mile square, which in connection with aerial survey is a very practicable size.

In the gnomonic map illustrated, the slight decrease in the east and west dimension of the divisions, owing to the convergence of the meridians, is given for each degree. One degree of longitude at 45°N being 49 miles (statute) and at 52°N being 42.7 miles. The dimension north and south is, of course, constant.

Similar methods can readily be adopted for other parts of Canada and areas between meridians 60°W and 80°W would be referred to with the prefix Eastern, between 80°W and 100°W as Middle, between 100°W and 120°W as Western, and between 120°W and 140°W as Pacific.

### MUNICIPAL SHADE TREE AND SHRUB NURSERIES.

Russell, Man.

To the Canadian Forestry Journal.

The following suggestion is intended to apply mainly to the three Prairie provinces but might be adopted elsewhere with advantage.

The suggestion is to establish in each municipality a small shade tree and ornamental shrub nursery, where the people could come and get what shade trees and shrubs they required. Of one hundred people in the West, one or two ardent tree lovers might invest in nursery stock from distant nurseries. The others want but the "Ninety and Nine," if they can get what they want within a reasonable distance, and where there need be no delay between the nursery and the planting, will take advantage of it to the full, and that with the chance of far greater success than the nursery stock, after the vicissitudes of the journey with its inherent delays, almost certainly a week, and very probably longer, between the nursery and

the planting.

As to the nursery itself: A small plot of good land, clean and well cultivated. Water must be available. A six-foot board fence to act as fence and windbreak until the nursery grew its own hedge and windbreak, but all advantage should be taken of any shelter available.

An expert's advice would be of great benefit at the beginning and perhaps the Experimental Farms, the Provincial Government or the seedsmen might be able and willing to help. The cost need not be great. The land, labor, fencing, a small shed for tools, etc., perhaps a well and a few pounds of tree and shrub seeds, a garden seed drill and the requisite tools.

Such is my "suggestion."

The writer is no horticulturist and the idea may be crudely put, but the basic idea is there, and that is to put within easy reach of the people what I think they need and very much desire, but are never likely to get unless some such scheme is adopted.

"Utility and Beauty."

#### TO NEW SUBSCRIBERS !

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Membership in the Canadian Forestry Association, \$1.00.

Practically all readers of the Forestry Journal are members of the Association and pay the inclusive fee of \$2.00. You are urged not only to subscribe to the Journal, but to accept membership in the Association.

#### FROM A NOVA SCOTIA MEMBER

"By educating the public through the Canadian Forestry Journal I think you are doing a wonderful work towards the preservation and reforestation of our woodlands throughout the Dominion."

## Why British Columbia Needs a Forest School

by Captain H. R. Christie, M. C. Victoria, B.C.

Education has proved the best national investment. It is the stabilizer of society. The countries and the peoples which have best stood the terrific strains of war and peace are those which foster education. It is the searchlight of industry. The nations foremost in the world today are those which study science and apply it.

An educational policy from an economic standpoint should be based primarily on the conservation—or in other words, the wise utilization—of natural resources. These, in British Columbia, are chiefly forests, minerals, agricultural land and fisheries. The University of British Columbia has well-established faculties in agriculture and mining. There is every reason also for the provision of a faculty of forestry.

### Put the Scientist at Work Here!

The forests are probably the most valuable natural resources in British Columbia. They form the largest single source of Crown revenue. British Columbia has been likened to a great timber farm. The simile is good. The bulk of the land area is forested and is more suitable for growing timber than any other crop. Over a large part of the province conditions for timber growth are more favorable than elsewhere in Canada. Great quantities of timber have been destroyed by fire, as in other provinces, but there still remains a stand estimated at three hundred and fifty billion board feet of saw timber, which is half the total stand of saw timber credited to Canada. In addition, there are over sixty million acres of young forest growing up. A crop like that deserves some study.

The province has a dominating interest in this great wealth. Timber licenses and leases sold in the past

yield revenue in the form of ground rent and royalty. Timber sale licenses of the present yield an additional revenue, called stumpage. Timber licenses carry title to the timber, but not to the land. That remains the property of the Crown. The great bulk of forest land in B.C. is owned by the Crown. Even on most Crown-granted land royalty is payable on timber cut and sold. Assets carry obligations. Provision for forest education is an obvious responsibility of the biggest timber owner in Canada—the province of British Columbia.

### Train Canadians at Home!

Forest administration in British Columbia, as elsewhere in Canada, is handicapped by shortage of foresters. British Columbia, lacking a forest school, has been, and still is, dependent on outside universities. These were drained by the war, and will have few graduates in forestry during the next two or three years. There is a great deal of investigative work requiring attention. Examples are: Studies of growth and yield, reproduction, regeneration, slash disposal, reconnaissance, etc., etc. Men with a university training are needed for this work. The logical source for them would be the under-graduates and graduates of the Faculty of Forestry, University of British Columbia.

The approaching exhaustion of the virgin timber stands of eastern and southern North America is already reflected by the accelerated demand on the Pacific northwest. Vast as are the western forests, they are no more inexhaustible than were those of the east. The time to practice conservation is before—not after. A diagnosis for the living is better than a post mortem for the dead. The time for a forest school in British Columbia is now.

# Active Work at Quebec Tree Nursery

(by G. C. Piche, Chief Forester of Quebec, in 1919 Report)

During the current year we shipped 941,500 plants, representing a total value of \$3,800. As in the past, the lumber companies, the Laurentide and others, continued to encourage us. Moreover, we sold many ornamental trees to individuals and distributed, free of charge, to various educational institutions a certain number of young trees in order to diffuse a knowledge of forestry.

We continued planting ornamental trees and we now have over 35,000 plants.

Owing to the successive additions to the nursery, we had to completely stop agricultural work through lack of space. If we are called upon, as we foresee we shall be, to produce between five and ten millions of plants per annum, we shall have to buy other lots of lands to enlarge our nursery, because we have no other additional space.

We shall have to put up a seed-house, and organize ourselves for gathering the seeds of the various forest trees of the country. Hitherto, we have been obliged to get our seeds from abroad, but it is now time to think of obtaining our supplies here, for this will enable us to reduce our expenses and to have more vigorous trees from acclimated stocks.

## WIRELESS IN FORESTS.

Wireless telegraphy as a means of reporting forest fires may soon be generally used in British Columbia. Efforts are now being put forward by the Forest Branch of the Department of Lands at Victoria, with a view to ascertaining the feasibility of the plan, and while definite action may not be taken in the matter for a few months, the question is receiving serious consideration.

Chief Forester M. A. Grainger strongly advocates the establishment of a wireless telegraph system in the principal forest districts of the province, and he is now seeking information on the probable cost of the pro-

ject. He feels that the plan would lead to a substantial reduction in the cost of fire fighting and protection, and that it would be of important service to the lumber industry as a whole.

The scheme has been considered from time to time by the department, but indications are that it has now reached that stage of development where something of a definite nature will be done. Mr. Grainger, in conversation with a representative of the Pacific Coast Lumberman, expressed the hope that this year would witness the development of the project into something tangible. He is pretty well convinced that the step would be worth taking, and it is now merely a question of departmental policy to be decided by the government itself.

## AN AERIAL MAPPER.

Readers of the Forestry Journal will be interested in an advertisement appearing in "The Aeroplane in Canada," by Price Bros., Quebec, calling for an aerial photographer to map timber limits. This is probably the first "want ad." of its kind ever published.

**Aerial Photographer.** — This Company seeks the services of a man with successful experience in the work of developing and printing aerial photographs and who is capable of making up maps from these photographs. Returned flying officers with experience and knowledge of this work are eligible for this position. During summer of 1920, this Company plans to photograph its timber limits from the air in order to obtain accurate aerial maps. It is essential that applicants shall have done this work at the Front. Applications may be directed to the offices of this Company, Price Bros. & Co., Limited, Quebec.



Ingenika River Falls, tributary to Finlay River, British Columbia.



Finlay River Falls, British Columbia.

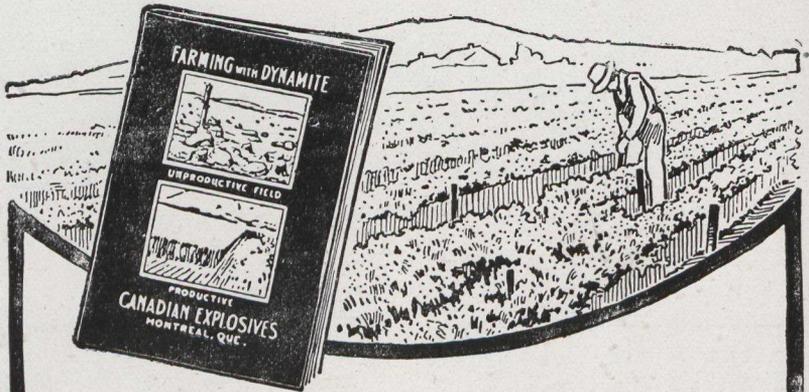
# Quebec Plans for Systematic Cutting

(G. C. Piche, Chief Forester of Quebec in his Annual Report)

We have to note a marked progress in the organization of operations. In the month of April last, the Department made an inquiry for the purpose of ascertaining, as soon as possible, the places where the license-holders intended to work this winter and in order to be able to determine, within a short delay, the sections where the trees could be cut at a smaller diameter than that fixed by the regulations owing to forest conditions. This enabled us, during the summer, to inspect a great many

places and to report on the advisability of modifying the regulations or of insisting upon their being strictly followed.

We consider this a considerable progress and a step in the direction of systematic organization and the making of a programme for cutting laid out, not for six months or a year in advance, but rather for several years; in a word, we shall soon have working plans and shortly afterwards plans for successive cuttings. This



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year, we intend to begin inspecting as early as the month of January, if possible, so that the license-holders may know the decisions of the Department in the early spring and what they will have to do. The advantage of doing this work in winter is that it enables our men to compare the places where work is to be done with those which are being cut and those already cut over in the neighborhood. The cost of this inventory, combined with those of the supervision of the cutting, is consequently lower than if the work was done during the summer when travelling in our woods is less easy than in winter.

#### Supervision on Private Lands.

As in the past we have devoted much time to the inspection of lots granted to settlers for the purpose both of ascertaining the progress made in clearing and of preventing illegal cutting, which, as very frequently happens, is done by unscrupulous holders of location tickets. To succeed in having a sufficiently effective control, it will be necessary

to inspect the lots at least three times a year, as is done in Abitibi. Such vigilance has a wonderful effect.

#### THE OLDEST NOVEL.

(London Sphere.)

The oldest work of fiction extant is thought to be "The Tale of Two Brothers," written 3,200 years ago by the Theban scribe, Enana, librarian of the palace of King Menepthah, the supposed Pharaoh of the Exodus. The tale, it appears, was written for the entertainment of the Crown Prince, who subsequently reigned at Set II. His name appears in two places in the manuscript, probably the only surviving autograph signature of an Egyptian king. This piece of antique fiction, written on nineteen sheets of papyrus in a bold hieratic hand, was purchased in Italy by Mme. d'Orbiney, who sold it in 1857 to the authorities of the British Museum, where it is now known as the d'Orbiney papyrus.

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## A WOODEN MAGNET DRAWS THEM.

The following remarks by President Dodge, of the International Paper Company, New York, will interest our readers. Canadians, of course, will not necessarily deplore the sound laws that compel U. S. paper mills to cross the border and do their manufacturing here.

"The United States printers are largely at the mercy of foreign producers and there is no encouragement for the United States manufacturers to invest another dollar. Not being able to obtain wood from our holdings in Canada, the International company is now erecting its first paper mill in Canada, being forced to do so in order to obtain a return from its timber investment. This will probably be followed by other mills. In brief, the American manufacturers<sup>s</sup> are being forced to take American capital out of the country and invest it abroad in order to protect themselves.

"Wood suitable for papermaking is rapidly disappearing. A number of United States mills will have to cease operations within a few years. The International company, producing practically 2,000 tons of paper a day, is being compelled to convert certain of its mills for the production of other papers. It will endeavor however, to hold its production of 1,200 tons, more or less, of newsprint a day, and if possible to increase this production in time."

## TREE DESTRUCTION CONDEMNED.

"That this meeting place itself on record as being in favor of legislation compelling the Hydro-Electric Power Company, Bell Telephone Company, Niagara Power Company, and other similar corporations, when about to string wire or erect transmission wires, lines which are likely to injure or interfere with growing trees, to obtain the permission of the Ontario Department of Forestry and the council of the municipality through which

such lines may pass and the owner of such trees, before commencing such works."

Passed at a meeting of Ontario horticulturists at Guelph, Ont.

## GOVERNMENT BUYS A SAWMILL.

(Australian Forestry Journal.)

Statements were made during the last session of the Victorian Parliament that building, chiefly in Melbourne, was being seriously hampered owing to the operations of the brick and timber combines. The Victorian Premier (Mr. Lawson) has announced that the Ministry has authorized the Forests Commission to purchase from the Nayook Sawmilling Company, Upper Latrobe River, near Powelltown, its sawmill plant, together with all buildings, mill and logging, tramways and other equipment, and the leasehold rights over a valuable milling forest of 2,100 acres.

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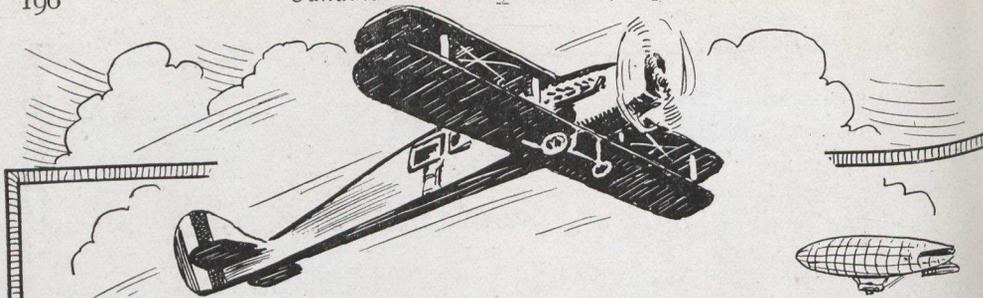
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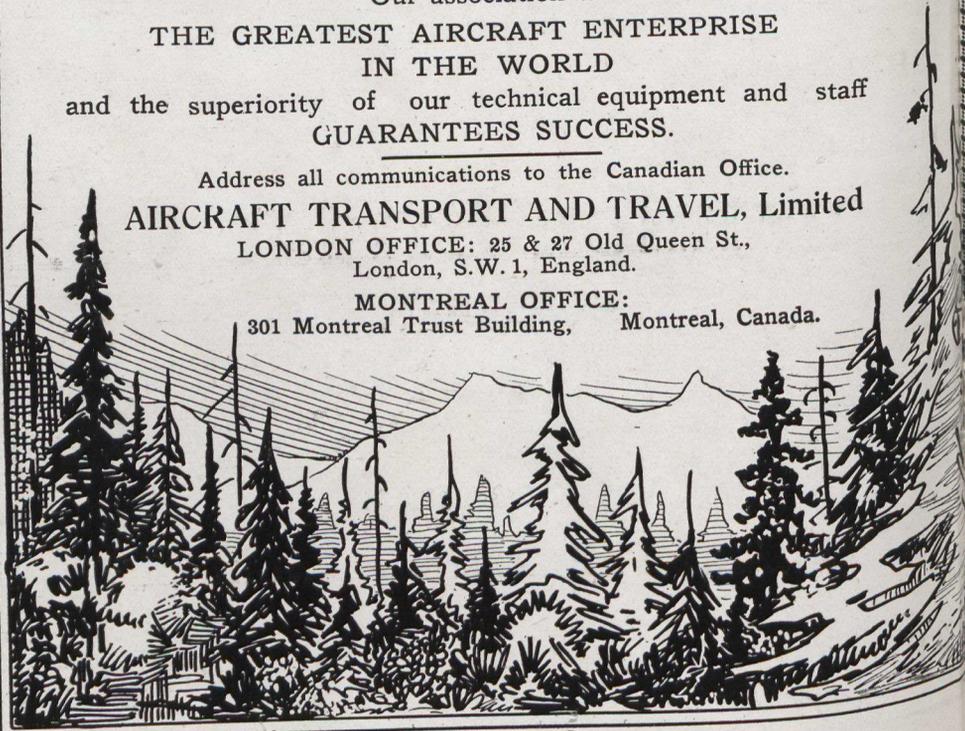
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## New Brunswick Trebles Its Forest Income

The forest revenues of New Brunswick have more than doubled during the past year. It is estimated that the total will amount to about \$1,500,000. This is nearly three times the forest revenue for 1917, and closely approximates the forest revenue of Quebec. It falls only a few hundred thousand dollars short of the forest revenue of Ontario. This is on a cut of some 343 million feet of logs, ties, poles and pulpwood, supplemented by some minor sources of revenue.

The province of New Brunswick has achieved this highly satisfactory result by a thorough reorganization of its forest service. This is now administered by an Advisory Board consisting of three representatives of the Provincial government, and two representatives of the timber owners. Patronage has been eliminated and efficiency and economy have been furthered by making the one organiza-

tion responsible for the various lines of forest work, including fire protection, enforcement of cutting regulations and timber scaling. The staff employed consists of full-time men, who work for the Government only. Hence the scaling has been much closer, and this fact, together with a higher royalty and perhaps a slightly increased total cut, has brought about the immense increase in revenue and thoroughly vindicated the Government's progressive forest policy.

—C. L.

### BRITISH GOVERNMENT DROPS ITS TIMBER.

(Manchester Guardian.)

The Government have now disposed of their entire stock of foreign softwoods, both at home and abroad. The purchasers are the members of the importers' section of the Timber Trade Federation, and the price is stated to be about £10,000,000.

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## WOODLOT IMPROVEMENT.

In answer to an inquiry from the Canadian Forestry Journal, Lt.-Col. J. W. Harkom, Melbourne, Quebec, an industrious improver of his own woodlands, sent the following remarks:

With intelligent care, farmers' woodlots would give returns that now seem, to the average farmer, unlikely; but wider knowledge is necessary to give such men interest to stimulate their action.

For one thing, the allowing of cattle to run at large in the lot must be prevented. It takes but little time to see how much damage is done by the practice.

Then careful cutting and trimming would furnish much more fuel wood than at first sight would appear, and the result in the growth of timber and general appearance of it would give an added value to the property.

Planting, and encouragement of

naturally-sown young trees would, in a few years, give still more value.

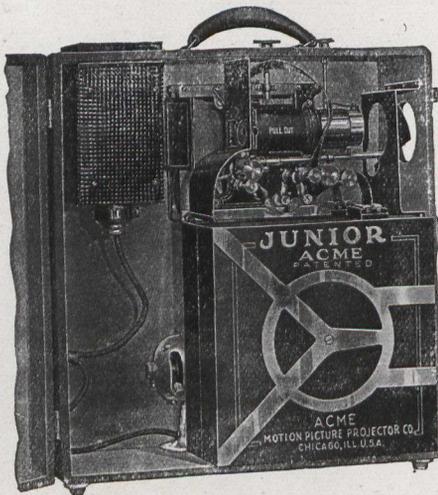
These latter three points cover what I consider the chief work of a small woodlot requires to change it from the present general valueless appearance to an asset.

It will be perhaps only by some State action that a wide improvement could be effected, and that by taking over some areas and demonstrating what can be done and its value.

An estimate as to values in cash is not practicable except by survey of the actual sites.

There are several reasons why the woodlots are constantly running down: Thoughtless cutting; grazing carelessness about forest fires, and lack of thinning.

The remedies are simple and easily applied. What then is the trouble? I think there are two reasons for this, both of which lie in the attitude of mind of the farmer. First of all, he is not accustomed to think of his farm



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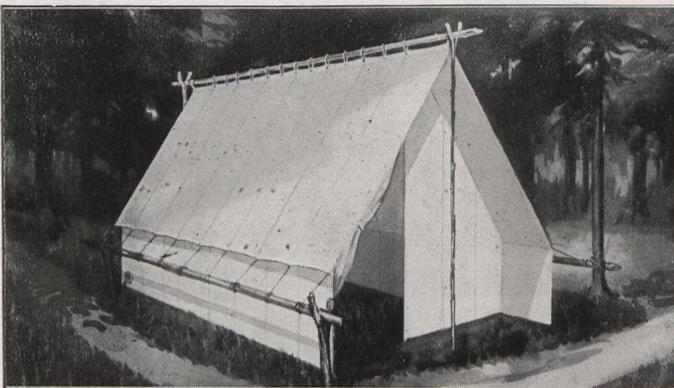
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woodlot in the same way as he does of his live stock or of his formland. He continually thinks of these as invested capital which should return a regular profit. He thinks of his woodlot, not as profit-earning capital, but as something more or less beyond his control. Second, the farmer is not well informed as to the possibilities of the profitable practice of forestry on his woodlot. He fails to realize the opportunity open to him of learning how to make his woodlot pay.

Year by year our woodlands are getting into worse condition. Year by year the prices of our wood products are increasing as the supply decreases. The war has taught us something of what we have to do in order to make economic and efficient use of what we have. Is it not the duty of every thoughtful man, on or off the farm, to make the most of what he has, be it personal ability, education or invested capital in the form of woodlots?

### CAPITAL IN LUMBERING.

According to a preliminary report on the lumber industry of Canada issued by the Dominion Bureau of Statistics, the total capital invested at the end of 1918 was \$180,017,178, of which logging and timber plants totalled \$36,516,701, mill equipment \$53,791,373. The total number of operating plants was 3,086. The number of persons employed on salaries was 3,550, and the total salaries paid

were \$4,911,735.

The average number of persons working for wages totalled 56,816, of whom 26,735 were employed in operations in the woods, and 30,080 in the mills. The total amount paid in wages was \$44,490,917.

By provinces the value of the lumber cut was as follows: Alberta, \$473,694; British Columbia, \$27,992,976; Manitoba, \$1,240,052; New Brunswick, \$12,189,312; Nova Scotia, \$4,089,039; Ontario, \$33,165,137; Prince Edward Island, \$136,336; Quebec, \$20,916,6604; Saskatchewan, \$2,122,307; Yukon, \$10,315.

### BOOK REVIEW.

Forests and Trees. B. J. Hales, B.A., LL.B., Principal Normal School Brandon, Man., Macmillan Co., Toronto, 1919. 205 pages, 72 illustrations.

In the preface of this book, recently off the press, the author has stated its purpose is to assist in impressing upon the young the value of our Canadian forests. The book doubtless will have great value in schools; however, it is by no means a child's book, since it can be read with interest and advantage by older people who desire to learn something of one of Canada's most important natural resources. The author deals largely with conditions in our three prairie provinces, but the remainder of Canada has not been neglected. He has succeeded in presenting in a way that makes interesting reading, much information that makes the book valuable to

dwellers in all parts of Canada.

The subject matter has been treated in two sections. Part I deals with the forests, their economic and aesthetic values, devastation and preservation, and includes several chapters on tree growing which can be read with profit by those desiring to grow trees under prairie conditions. Part II is comprised of short notes on many of the tree species native to the prairie provinces and British Columbia, including a brief description of a few exotic trees.

The book is well illustrated with 72 photographs, diagrams and drawings.

#### "SATURDAY NIGHT'S" VIEW.

"Four hundred miles of telephone lines are to be laid through the forests of the upper Ottawa district as part of the scheme of the Ottawa River Forest Protective Association for the prevention of forest fires. The decision to proceed with the construction of 200 miles of these lines at once was reached at the annual meeting of that organization, which concluded here recently.

"Arthur H. Graham, Chief Fire Inspector, in the course of his report, stated that last session was one of the worst for forest fires in many

years. He said that 20,000 acres, or 31 square miles, of valuable forest was burned by unextinguished lunch fires, careless smoking by campers, travellers and berry-pickers, slash burning without fire rangers' permit."

Four hundred miles of telephone wire to send messages telling us what fools we are.

Thirty-one miles of timber making a bonfire in one year to show what fools we are.

Everything we do seems to be — put out fires—why not prevent them?

The forests of Ontario should have a close season on two things from now to eternity. Cigarettes and strike anywhere matches. The danger from pipes and safety matches is infinitesimal, comparatively speaking. Then punish everyone who leaves a camper's fire burning, whether damage ensues or not. It is not laws we want. We want enforcement of such laws; certainty of punishment even though it be mild is a great deterrent. Drastic statutes with lax enforcement breed contempt for all law, and are worse than no laws at all.

### "Canoes that have made Maps and History."

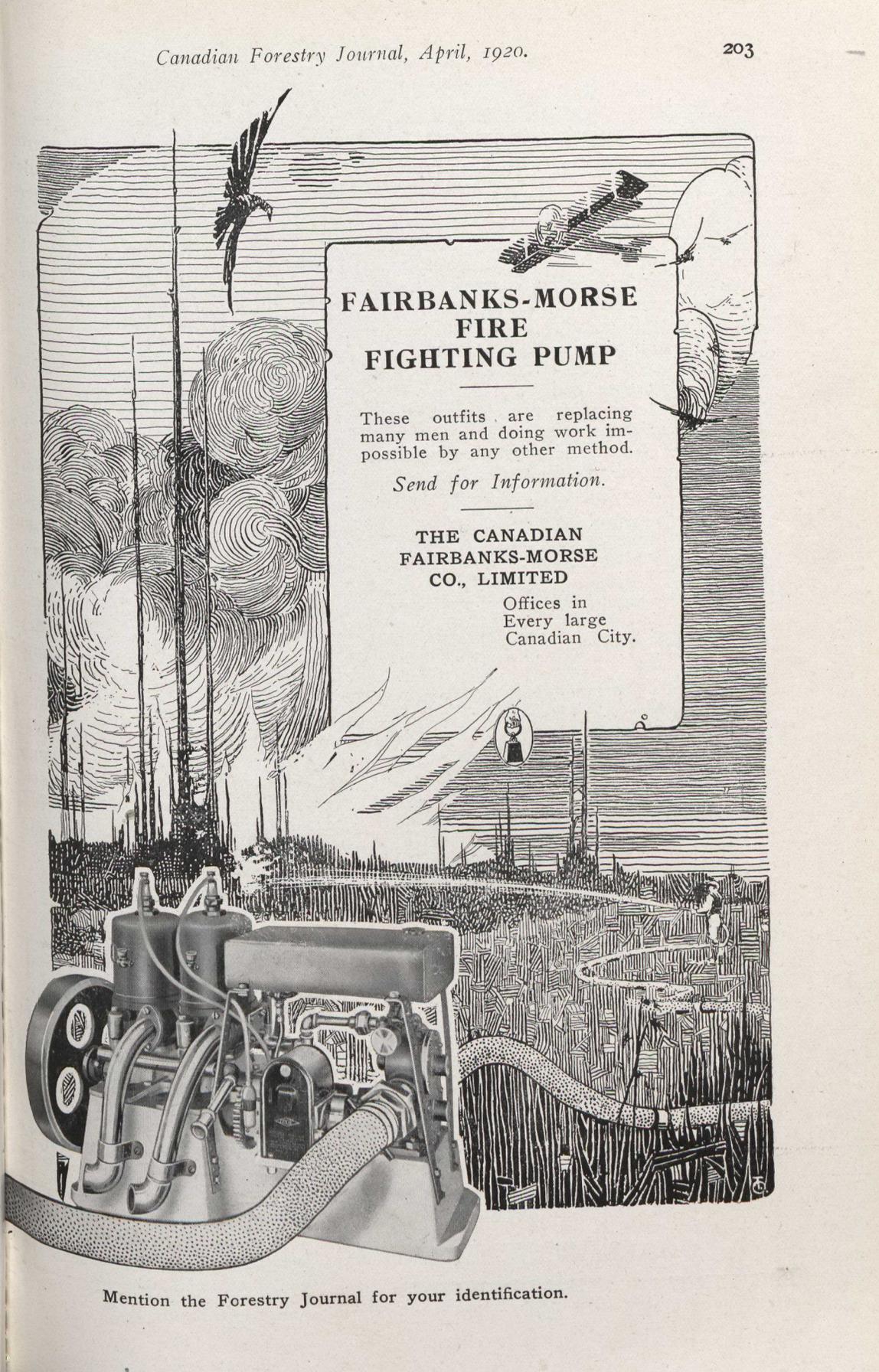
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A detailed black and white illustration of a forest fire scene. In the foreground, a Fairbanks-Morse fire fighting pump is shown in detail, featuring a large flywheel, various pipes, and a hose. The pump is positioned on the left side of the frame. In the background, a forest is engulfed in flames, with thick smoke rising into the sky. A fire hose is laid out across the ground, leading from the pump towards the burning area. A person is visible in the distance, near the fire. The sky is filled with smoke and a large fireball is seen in the upper right. The overall style is a fine-line woodcut or engraving.

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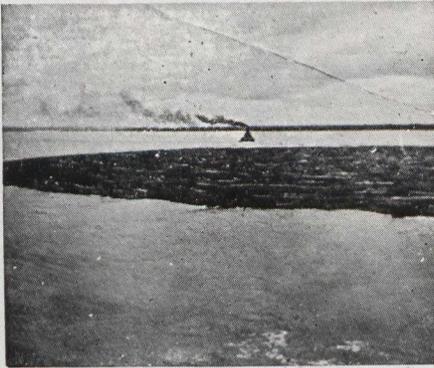
**LATENT POSSIBILITIES OF THE FARM WOODLOT.**

By E. C. M. R., in Rural New Yorker.

As a timber estimator who is called upon to travel about the rural districts of the country, I have noticed one thing of special interest in the farming communities, and that is the almost universally run-down condition of the farm woodlots. And this condition of the farm woodlots is growing worse and worse year by year as the constant misuse or neglect of the woodlots goes on. As forestry is one of the most important branches of agriculture, I feel that attention should be called to this serious situation.

The present system of harmful treatment of farm woodlots is shown

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by the fact that it is growing harder and harder to get any good telegraph poles, saw timber or even railroads locally in our rural districts. At many localities any small patch of good timber is today a noteworthy thing, even where every farmer has a comparatively large proportion of land covered with tree growth. On making inquiries a man like myself generally finds that everyone recognizes that the woodlots in the neighborhood are running down year by year.

**D. E. HUTCHINS KNIGHTED**

Sir David Hutchins, knighted in recognition of his services to forestry in the Empire, has worthily earned that honor. The record of his official and other activities as a forester is one upon which he has every right to look back with pride. After serving for ten years in India, and for a time in South Africa, he organized the Forest Service of British East Africa and controlled it to the time of his retirement as Chief Conservator. In 1909 he was retained by the British Government to report on the forests of Cyprus. He is the author of many authoritative works on forestry, and the eminence he has attained in his profession is indicated in the fact that

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only three other foresters had previously received the honor of knighthood. It is not the least noteworthy feature of a distinguished career that at an age when most men would have been content to seek leisured retirement, Sir David Hutchins devoted himself to the somewhat thankless task of urging the claims of forest conservation in countries where as yet its importance and the benefits it offers are little understood. It is very largely due to his efforts and skilled advice that systematic forest development is now in progress in all the Australian States except Tasmania. In a comprehensive report on New Zealand forests he has paved the way for similar progress in this country. It is due to the unfailing enthusiasm of Sir David Hutchins in the work to which his life has been devoted that measures are at last being taken to salvage the wreckage of our once magnificent forest estate.

"The Dominion," Australia. To the many Canadians acquainted with the distinguished services of Sir David Hutchins, the above tribute will be heartily applauded.—Editor.

**REFORESTATION IN N.Y.**

Watertown, N.Y. — The National Paper Products Company, of Carthage, which operates a big tissue mill and factory for making up the product of the mill into paper towels and other sanitary articles, has decided to reforest its timber tract near Streeter Lake in the Star Lake region of the Adirondacks and will start the work this spring.

Last fall under the direction of the director of the State Ranger School at Wanakena of the State College of Forestry, the class of ranger students



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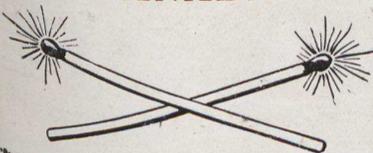
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**GEO. Y. CHOWN, Registrar.**

spent ten days on the tract, making surveys and topographical maps and outlining a plan of action for the reforestation project.

The tract consists of 1,700 acres and has practically all been lumbered over for pulp wood by the National Paper Products Company and its predecessor, the Carthage Tissue Paper Company. It is now proposed to plant about seventy-five acres this year and each year a certain amount until the tract is completely reforested. Several pulp and paper companies in this region are now reforesting their Adirondack tracts and it is likely that many others will follow suit in future years.

### REFORESTATION A PUBLIC JOB.

Federal and provincial governments should contribute appropriations for reforestation purposes in Canada, said Mr. A. E. Clark, of Toronto, in an address to the Electric Club, for "the very high cost of re-

producing forests is the reason why lumbermen and timber interests should not be blamed for lack of activity along reforestation lines. Lumber concern is justified in making reforestation investments which will not fruitify for at least one hundred years, although pulp wood and similar grades can be reproduced in from thirty to forty years. Government have so far seen fit to shirk this obligation."

There should be no comparison, said, between reforestation methods in European countries and Canada. The soils were different and the methods adopted in Europe are entirely inapplicable here.

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