

The Illustrated  
**CANADIAN  
FORESTRY**  
Magazine

VOL. XIX

OTTAWA, CANADA, MARCH, 1923

No. 3

**This Issue  
Contains: -**

**There's Money in a  
Maple Bush**

By Robson Black

**Forestry and the  
National Defense**

By Dean Henry S. Graves

**An Appreciation of  
the Late Dr. B.  
E. Fernow**

By Dr. C. D. Howe

**Jack Miner is a  
Tree-Planter**

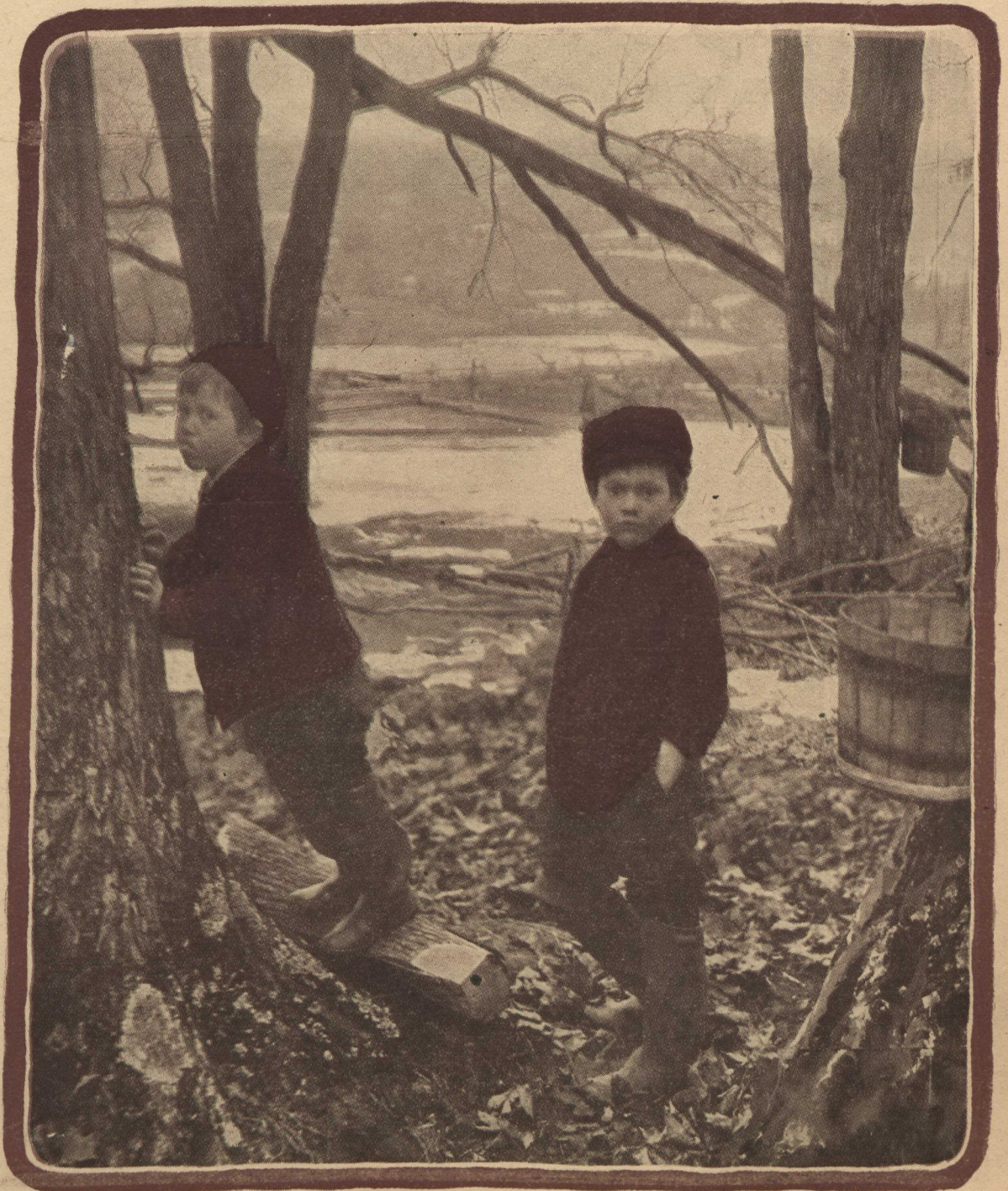
By George A. Mackie

**Prairie Trees Satis-  
fy Home Hunger**

By M. J. Stevenson

**Photos and Essays of  
Some Prize-Winners  
in Recent Competi-  
tion.**

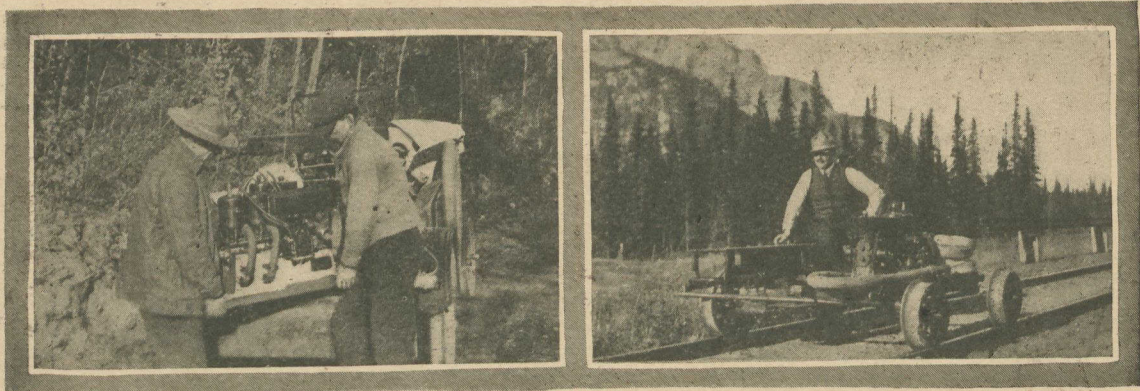
**And many other  
seasonable features  
specially illustrated**



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TWO NATIVE CONNOISSEURS OF THE MAPLE SUGAR INDUSTRY

See Feature Article Page 149



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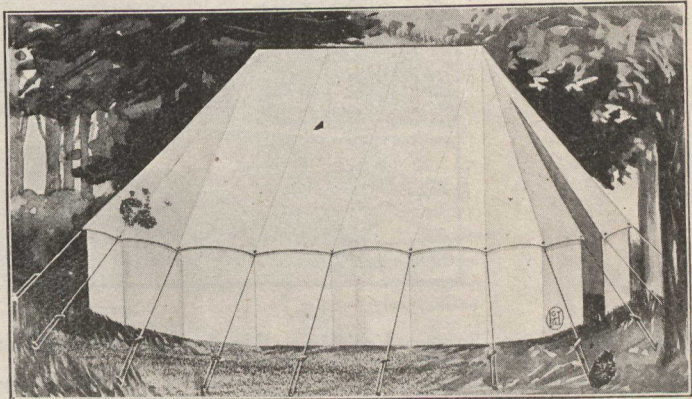
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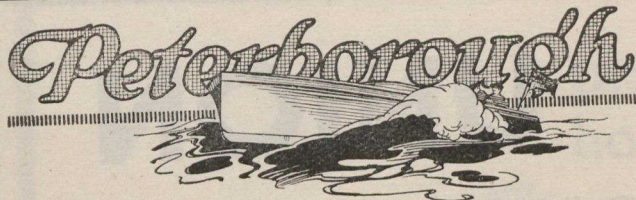


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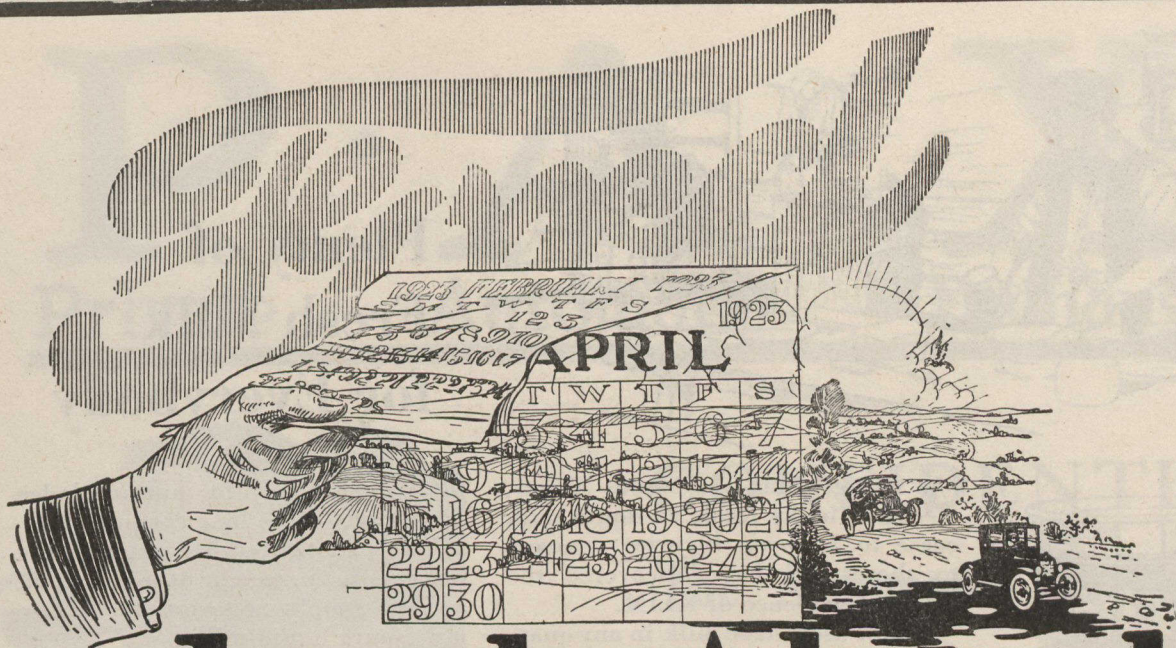
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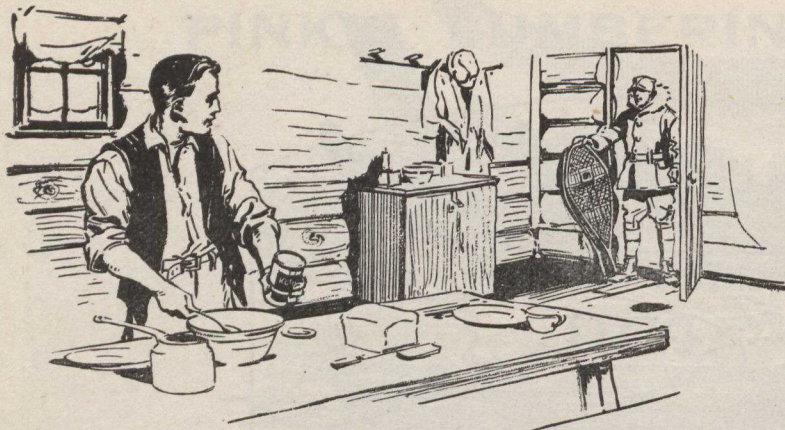
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THE  
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FORESTRY  
MAGAZINE**



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

VOL. XIX

OTTAWA, CANADA, MARCH, 1923

No. 3

Published and Owned by The Canadian Forestry Association

*Editorial and Business Offices*

STANDARD BANK BUILDING, 81 SPARKS STREET, OTTAWA, CANADA.

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

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

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The remarkable performances by Linn Logging Tractors in operation on the limits of various Quebec and Ontario operators, have, so far, been witnessed by a great many interested operators.

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As a result of the long tractor experience of this firm, the wonderful power, economy and reliability of the Linn is perhaps more evident than to an operator heretofore unused to Tractor haulage.

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# There's Money in a Maple Bush!

How Fifty Thousand Canadian Farmers are Extracting Millions From the Annual Flow of Sap.

By Robson Black

(Plates reproduced by courtesy Department of Agriculture, Ottawa.)

**M**ARCH brings the Harvest of the Maple Tree. Millions of maple trunks on 55,000 farms will pour out their unmatched nectar and a few months later from five to seven million dollars will represent the reward of the Canadian farmer's Springtime industry.

Twenty million pounds of maple sugar! Such is the maple trees' happy gift each year to the farm owners of Eastern Canada.

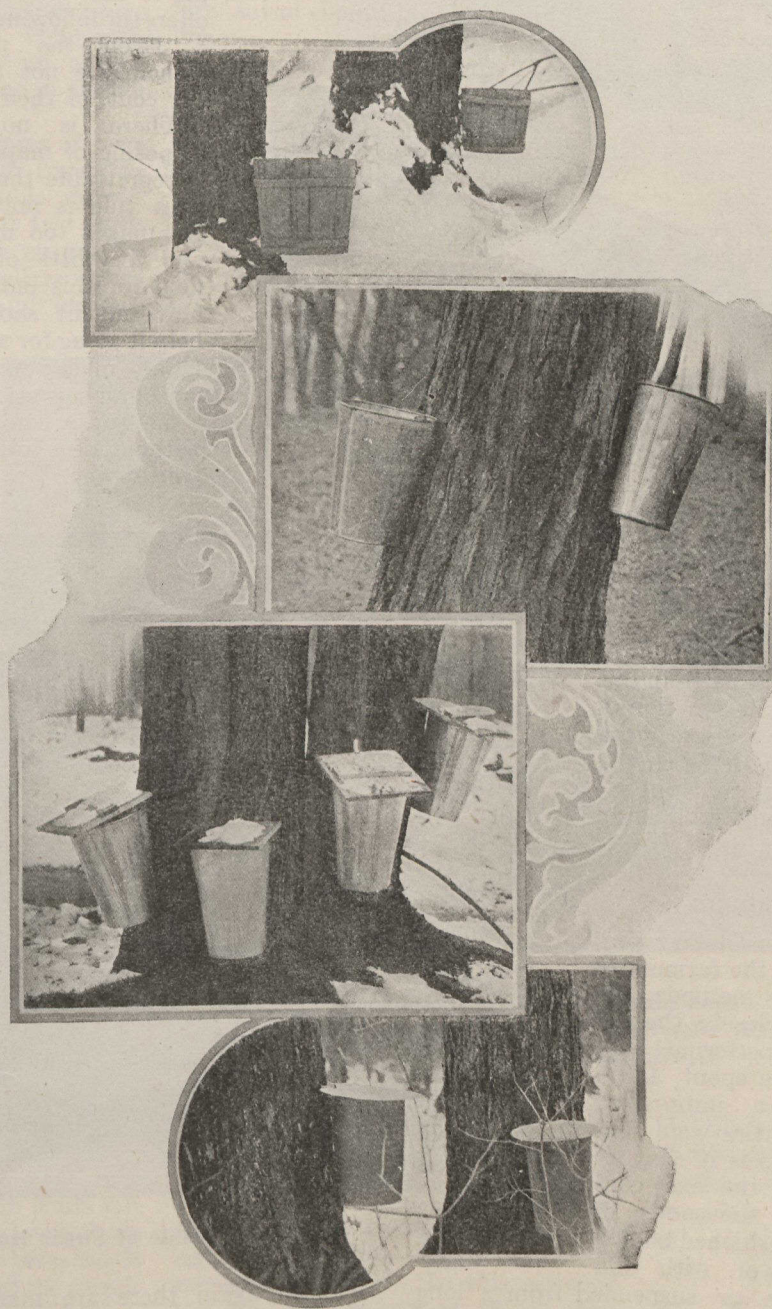
In the boyhood of most of us, "maple sugar making," suggested the picturesque experience of a "sugaring-off party" where business cares were forgotten, petty discomforts were winked at and every body from the county judge to the grocer's lad loaded into a democrat and bumped along to the sugar bush, the air made jubilant with laughter and excited shouting. One may visit many parts of Ontario and Quebec and the Maritime Provinces where the same happy observance holds its place, where the sugaring off party is just as noisy and insatiably hungry as ever. The striking change in those thirty years, however, is in the systematizing and organizing of maple sugar making as a business, greater elimination of waste and the official encouragement of the industry by the Governments through teachers and even special "maple sugar schools" exclusively devoted to the perfecting of the maple making process.

## Maple Sugar Schools

It is a long leap in time and method from the carefree Indian extracting crude maple sap by a gash of his tomahawk and the well organized Eastern Town-

ships or Ontario farm with its 2,000 maple trees carefully managed and contributing to the farmers of Eastern Canada over five million dollars a year. While it is true that thousands of old time maple woodlots have been cut down to provide a place for field crops and others have been needlessly and foolishly destroyed, the increased popularity of maple products in Canadian and foreign

markets with relatively high prices for quality goods, have been a partial compensation. Not only have hundreds of Quebec and Ontario and Maritime Province farmers introduced modern machinery for collecting and boiling down the sap and preparing it in attractive containers for a discriminating market, but the Quebec Government has recognized the new economic status of the Maple Sugar Industry by establishing schools for sugar makers. The Quebec Department of Agriculture has carried on, by funds provided by the Dominion Government under the Agricultural Instruction Act, three to four schools each Spring in charge of well skilled sugar makers. The instruction given is of a practical nature and includes tapping, sap gathering, and the various manipulations leading up to the finished syrup and sugar. The students assist with the work at the school and their board is provided them by the Provincial Department of Agriculture. These schools are situated at La Minerve, Beauceville, Ste. Louise, and St. Casimir. At these schools, trees are kept in numbers ranging from 3,000 to 5,000. In addition to this instructional work, five special demonstrators in sugar-making have each year travelled through the sugar-making districts giving



Sap buckets receiving the run.

The wooden buckets shown in the top scene are no longer used by the careful maple sugar-maker. Lower scenes show wooden and metal bucket covers.

demonstrations in the making of sugar and syrup. How necessary is this instruction may be judged from the fact that of about twenty million pounds of maple sugar manufactured during recent seasons not more than 10 per cent. grades No. 1, while 15 per cent. grades No. 2, 15 per cent. No. 3, and 60 per cent. No. 4. That is to say, of the twenty million pounds made each year, nearly twelve million pounds are of No. 4 grade, having a

evaporation of the sap underwent marked improvement, adding greatly to the flavor and color of the better grades of maple syrup and certainly assuring the consumer of a more healthful product. The great cost and scarcity of farm labor brought about the introduction of more rapid and easier methods of conveying the sap from the buckets to the boiling down house.

### 150,000 Men Used

As a factor in employment during a month usually considered dull, maple sugar takes unsuspected credit. With 55,000 producers each employing two men, as is the rule, there is represented a substantial wage distribution even if it does not extend much beyond thirty to forty days.

One of the acknowledged authorities on the maple sugar industry of Canada, writing to the "Canadian Forestry Magazine" offers the following comments and criticisms:

"Even the progressive maple bush owners are not tapping more than forty per cent. of their trees.

There is no difficulty whatever in disposing of maple syrup and sugar but it is regrettable that the Canadian producer as a rule is not a high grade producer. He makes too much of the fourth grade and very little of No. 1. There is a great field for this industry in Canada and the Government should be in a position to help it along for we believe it is the greatest money maker on the farm as the product is one of all harvest. It can be carried on in the same sugar camps each succeeding year without any injury to the trees by excessive tapping.



Antiquated systems of boiling still in use in many sections.

market value much below that of No. 1 goods. These poorer grades are not usually marketed by the makers to private customers and of course bring a much lower price. It is pointed out by experts in this industry that the persistent instruction of the maple sugar bush owner and the adoption of more up to date methods should easily reverse the showing and put at least 60 per cent. of the total production of maple goods in the No. 1 or No. 2 grades.

### More Sanitary Products

Before the high prices for quality products made it attractive to the farmers to discard the old, unsanitary methods, the white man followed very closely the old Indian methods which were performed with an axe, a wooden chip for a spout, and a clumsy and none-too-clean improvised bucket. Iron or copper kettles were substituted for the Indian vessels of clay or bark, but for a long time the axe continued needlessly to mar thousands of maple trees. The old fashioned boiling down process was carried on with iron kettles exposed to the open air, suspended from a long pole. This resulted in a maple product very strong in flavor, dark in color, and of quite uncertain quality. During the past 50 years the primitive extravagant methods have been gradually displaced. The auger was substituted for the axe in tapping and the gathering and



View of Inside of Sugar House.

Then again there are many localities in the old settled counties which do not make any maple sugar or syrup and if these sugar lots could be tapped, with the sugar bushes that are still Crown lands, the result would be that Canada would secure at least fifty millions a year from the maple industry."

# A Maple Bush Pays Better Than Pine

By J. B. Spencer, B. S. A.

**M**APLE lumber has long been a valuable commodity that has doubled in price within little more than a decade. It is only reasonable to expect that ten years hence will see it much more valuable than at the present time. For this reason reforesting with maple should prove a very remunerative enterprise, yielding in a few years an annual crop of sugar and a heritage in timber of no mean value.

Unfortunately the stripping of even our rocky lands of their trees has gone on to an unprofitable degree. A maple tree that will cut two cords of wood is worth on the stump for that purpose about ten dollars at the present price of wood and lumber.

The annual interest on this sum is from 60 to 70 cents. The tree, if left to grow into considerable value for itself, will yield an average of three pounds of sugar, worth anywhere from 75 cents to \$1, according to the intelligence of the maker. To clear off the maple timber from stony land unsuitable for farming purposes is like killing the goose that lays the golden egg. It should not and would not be a crime to cut mature trees; but the sin lies in not allowing others to grow. Reforesting with maple is undoubtedly as important as with pine or spruce. In view of the returns to be expected from each of these kinds of timber there can be no doubt of the real economy of not only conserving the maples on rough lands but also in taking action to reclothe those rugged districts that have been made utterly barren by the loss of the forest.

## Reforesting With Maple

In the opinion of Mr. R. H. Campbell, Director of Forestry in the Department of the Interior, it is more profitable to reforest with maple than

with white pine. In response to an inquiry as to the relative cost of reforesting with maple as compared with pine Mr. Campbell writes as follows:—

In determining the cost of producing any merchantable timber, there are seven points to be considered, viz:—

- The value of the land.
- Taxation.
- The cost of plant material.
- The cost of planting.
- The cost of management and protection.
- The rate of interest on money invested.
- The time for the trees to reach the desirable size.



Through metal pipes the sap flows from the bush to the sugar house. Such equipment is being more and more adopted by the progressive maple bush owner where the size of his business warrants it.

It has been estimated that white pine planted on sandy waste lands in Ontario will yield, in sixty years, two hundred (200) trees averaging eighteen (18) inches in diameter, or about eighty thousand (80,000) board measure, per acre. In this estimate the land was valued at \$5 per acre; taxation figured at 17 mills; the cost of plants and planting \$10 per acre; the cost of management and protection at 15 cents per acre per year and the rate of interest charged was

3½ per cent. The total cost worked out to \$165.34 per acre. This does not include the thinnings which would probably yield a revenue after the twentieth year and somewhat reduce the cost.

Sugar maple grown under normal forest conditions would yield from one hundred and fifty (150) to one hundred and seventy-five (175) per acre, having an average diameter of eighteen (18) inches in about one hundred and fifteen (115) or one hundred and twenty (120) years. Provided all the other items, i. e. cost of land, taxes, etc., were the same, this increase in the length of time alone would raise the cost of

growing maple considerably above that of growing pine. The cost of the plants and planting would probably be 50 per cent. more than the \$10 figured on for pine. This is partly due to the heavier nature of the soil in which the maple would be planted and partly due to the higher price for maple seedlings.

It would appear then that if the price of white pine and maple lumber keeps the same relative position, it would hardly be a paying proposition to grow maple for lumber alone. However, when one considers the revenue derived after the thirtieth year from the sap and the high-

er price obtainable for thinnings as fuel, or making acetic acid, wood alcohol, and charcoal, there seems but little doubt that the maple would in the end be the more profitable tree. This is particularly true in case of the small wood lot owner or farmer, who has many uses for the wood, and especially where the maple already exists in the stand and natural reproduction can be secured.

# JACK MINER IS A TREE-PLANTER

By George A. Mackie

**J**ACK MINER, Philosopher, Bird Lover, Wild Life Protector, Lecturer, and Author, is also a Forest Conservationist. He proclaimed the fact "with pride" to me on the occasion of a recent talk with him. Taking advantage of a recent visit to Ottawa on lecture tour of this, Canada's most whimsical and entertaining Wild Life protagonist, I secured an all too brief half hour's interview with Jack Miner at the conclusion of a half hour's address which had set the Lion's Club of Ottawa a-roaring. Having read and heard very much of interest concerning this remarkable man whose bird sanctuary at Kingsville, Ontario, is one of the show places of Canada, I was prepared to meet a man of exceptional calibre. And in this I was not disappointed. Jack Miner is a man who will shine in any company. Not through any extraordinary linguistic or oratorical powers which he possesses, but through the innate goodness which fairly shines out of his bright and smiling eyes. He is essentially a lover of All Outdoors and gives the impression, without seeking to do so, of a man who loves his fellowmen as well as all other worthy things which live, move, and have their being on this old Earth.

"Well, I guess you are kept pretty busy?" was my opening interrogation having in mind numerous letters and telegrams which had been dispatched from our Ottawa office to secure a story from his pen.

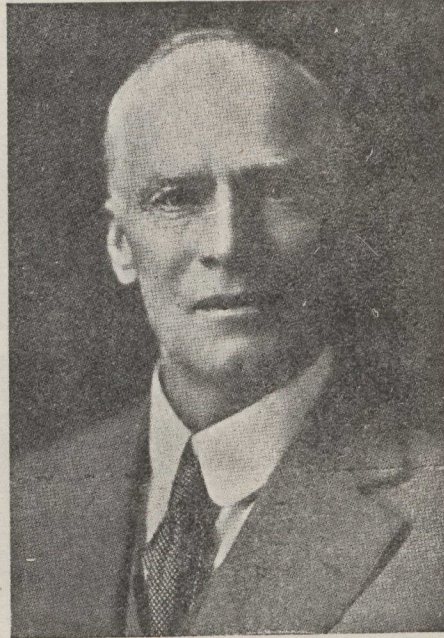
"Just about as busy as the proverbial one-armed paper hanger," was his response, "but as long as I am talking on my favorite subject I have no complaint."

"I know you are a wild life conservationist Mr. Miner, but I have never heard your views on forest conservation," I queried.

"Why bless your heart, boy," (save the mark), was his prompt reply, "I am a forest conservationist first, last, and all the time."

"A man couldn't run fast enough to give me a home where the trees are already grown. I want to grow my own. I have studied the woods all my life and, while I have never read any books on Forestry, I have done some

tall thinking and studying in the woods themselves. In the last ten years I have planted fully ten thousand trees on my own place at Kingsville and I just want to say that I consider it one of the most important



JACK MINER

and satisfying jobs I have ever done. The last four thousand trees I got were Scotch Pine. They cost me \$3.60 laid down at Kingsville. I planted

dinary tomato plants, in the eighth year they are now twelve to sixteen feet high and the naked clay field, as was in 1914, now attracts the public so, from far and wide, that I have had to fence it in, something I never dreamed of doing."

"You have a nice place at Kingsville I understand?"

"I have everything there but money," said Jack Miner, with a twinkle in his eye.

"I see that some towns are worrying about a park," he continued, "when I can grow a park that will shade thousands of people in ten years. This is proven out in my own home and I haven't done anything but what the other fellow can improve."

Getting down to commercial forestry Jack Miner expressed the opinion that the pulpwood question is one in which every live Canadian should be interested. "I know, from experience, that in places where it's now as bare as the sands over King Tutankhamen's tomb, in their own life-time they can start getting pulpwood 6" and more in diameter if our people will only wake up and start. These things are all here for us. The opportunity is ripe for everything that is good. All we have to do is each out and touch the key notes."

And here a new thought struck him and he emphasized it with a hearty slap on the shoulder.

"Why, bless your life! you could live in the same room with the best piano in the world all your life and unless you touched the keys it would remain dormant and of no good whatever, and there's no country in the world that has more of such untouched pianos than this same dear Canada of ours," and with that Jack Miner had to rush away for another appointment.

Before his departure he confided to the writer that he is at present working on a book which he hopes to publish next Fall and in which he is setting down some of his personal views re wild life and forest conservation. He has some original ideas on this, gained by long years of life in the open and whenever it is published it will be well worth the reading.



Young Tree-Growth on Jack Miner's Bird Sanctuary, Kingsville, Ont.

these trees in clay soil where trees wouldn't grow. This had been proven because another fellow's father, and Uncle Dave, had tried it and found it couldn't be done; but my old back-woods education refused to be discouraged. I planted this Scotch Pine on the second and third of May, 1914. Although these trees, when planted, were no higher than or-





The larger photo above was taken at Flaxcombe, Saskatchewan. It shows a cosily sheltered home with excellent gardens, tennis court, and all the other pleasant auxiliaries of a farm life. But please note that this property is an oasis in endless miles of bare veldt. The owner secured the trees from the Dominion Forestry Branch at Indian Head.

At the lower right is shown what can be done with trees on the treeless prairie. The scene is at Altario, Alberta, showing an outside row of red willow planted in 1916. Truly a magnificent result in six years.

Who says spruce won't thrive on the Western prairies? The photo at lower left furnishes convincing refutation. This picture was taken on a farm at Loverna, Saskatchewan.

# Prairie Trees Satisfy Home Hunger

A Plea for the Encouragement of Tree-Planting as Stabilizer of Population

By M. J. Stevenson, Morris, Manitoba.

**T**HE EARLY SETTLERS who first located in the West can well remember how they travelled for days at a time through a sea of grass without seeing a tree of any kind except along the water-courses. This has been changed somewhat by the planting of trees around the farm homes; but Mother Nature herself has taken a hand in the planting and has changed the entire aspect of the landscape in some districts.

Since the prairie fires have almost become a thing of the past due to the breaking up of the prairie and the grading of the roads, islands of poplar have appeared as if by magic miles from the parent trees, adding much to the charm of a prairie landscape.

In order to understand how Nature accomplishes this seemingly impossible task, let us look into the life history of this tree. Quaking aspen

(*Populus Tremuloides*) is the most widely distributed tree of North America. And it is safe to say the only tree which exceeds it in this respect in all the world is its near relative the European aspen. Together these trees nearly encircle the land surface of the globe. This very wide distribution is no doubt due to the light, fluffy nature of the seed which ripens in this latitude about the last of May filling the air with their cottony down and is blown for miles, covering ponds and sloughs with seed. This tree occupies a peculiar position in the forests of North America. Growing up rapidly over vast areas that have been deforested by fire or the axe, they attain as a rule only a small size and die at an early age. They are Nature's first effort to reforest burned areas and reclothe the prairie with trees. And it is this characteristic perhaps more than their

commercial utility that constitutes their chief value as a forest tree. To me it is very interesting to watch Mother Nature at work reforesting the prairie. Usually first upon the scene is the prairie willow. The trees of this species obtain a foothold in some slight depression and after a few years growth catch and hold the snow and help out the moisture question, always a paramount question in any tree planting scheme in the West. The willow leaves help to rot the sod and to make a damp mould ideal for the reception of the fluffy poplar seed. The result:—a few young aspens around the willows; these increase chiefly by root sprouts a wider area year by year. — And lo! the miracle has been accomplished and another "Island of Beauty" has been born upon the prairie sea and a new haven of refuge has been created for our feathered friends the birds.

You who are the fortunate owners of a bluff or two growing on a bit of unused prairie don't make the mistake that is commonly made in the West of fencing it and making a pasture out of it. Rather fence it and keep the stock out. The poplar, a very shallow-rooted tree, is much injured by the tramping of stock. The bark also is easily scratched and torn by stock. These wounds are always subject to fungus attacks which kill the tree in a very short



A corner in the garden of a prairie home rendered possible by the planting of a rapid-growing shelter belt.

time. If your bluff already shows dead tops and bears other evidence of old age this is a good time to underplant with white spruce or balsam fir. If you think it too much trouble to plant the whole area and are not in a hurry for results plant eight or ten good trees to the acre and watch Nature do the rest of the planting, after these trees have reached the cone-bearing stage. In a few years, if you look closely in the leaf mold you will find the young seedlings. These will have no trouble in growing up through the light crowns of the aspen and ultimately displacing it.

There are few prettier sights in the West than a bluff of aspens bursting into leaf in early Spring. The fresh green of their trembling leaves set in motion by the slightest breeze, famed alike in song and story, down through the ages represent a type of beauty peculiarly their own. Think twice before you sharpen your axe and grubhoe and attack that bluff of aspens Nature has so kindly planted.

If you cannot see anything to admire in its sylvan beauty, perhaps your neighbor can and would greatly miss its familiar outline upon the prairie landscape if destroyed. A fool with a few matches or an axe can destroy more real beauty in an hour than Nature can replace in a century. Most of us can remember some tree or a superb piece of woodland destroyed by a thoughtless owner. How our eyes unconsciously looked for the familiar picture that had, alas! gone for ever.

#### The Act of a Vandal

Within half a mile of my early boyhood home in Ontario, growing on a little speck of an Island thirty feet across near the centre of the Ottawa river, was a magnificent white pine. This tree, about five feet in diameter at the base, by reason of its location was already a very conspicuous object upon the landscape in 1842 when my grandfather first settled in this wilderness famed for its pine forests.

Having always grown in the open and being well supplied with moisture from the river it was a beautiful pyramid of blue green foliage from the ground up. One day at school we missed its familiar form. It had been felled by a man who could see nothing in it but a few dollars worth of lumber. And what did the vandal get? After felling, he found it hollow for nearly half its length and otherwise defective for lumber and after a deal of chopping and sawing he got one knotty log for the sawmill. The rest of the tree was left to rot where it fell. Its glorious crown that towered over a hundred feet into space nurtured for centuries by the Infinite, the first living thing to greet the rising sun of a new day, the last to receive its goodnight kiss at eventide, lay a shattered and mangled wreck. Its mission of beauty forever ended. How does three or four hundred feet of low grade lumber or a ten dollar bill look in comparison? Look once again at that old veteran upon the hillside before you lay it low. Some trees have a scenic value vastly greater than their cash value in cordwood or lumber.

Just now people are greatly interested in National Highways: the main idea no doubt being to attract tourists. But to attract tourists we must have something in the way of scenery for them to look at. And at the rate our forests and mountain sides are being denuded by the fire scourge it will not be long till we have nothing left.

Some time ago I saw a picture entitled, "The Great Divide." This photograph showed a spring on the crest of the Rockies, the waters of which divided, part flowing down the West slope and eventually into the Pacific, and part by way of the East slope into Hudson Bay. The region around this spring had been heavily forested by Engellmann spruce and Fir but had already been visited by the fire fiend; not a green tree in sight. Its scenic beauty entirely gone.

A picture that might have made

history, gone forever by someone's carelessness.

That superb hanging garden on the mountain side with its purple folds of Fir and Spruce must be saved. We cannot afford to have the fire fiend change it into a charcoal drawing of desolation. These mountain fires are particularly destructive. In some cases it has taken Nature hundreds of years to get enough soil together to grow a forest and one fire will often burn completely both soil and



This picture shows what can be done in the way of tree-planting the shore of a prairie lake in eighteen years.

forest, leaving nothing but the bare rocks. A few beauty spots are a valuable asset to any community; so let us take care of what we have before it is too late. There are trees that money could not buy. I have seen single specimens of the American white elm and Eastern white pine with enough beauty to woo a man half way across a continent.

Here in the West there is a vague longing and restlessness amongst the people. What is the trouble? It's the Soul hunger for the beautiful. That tired, overworked housewife must have something more beautiful to look at than a barb-wire fence or that string of disabled machinery lying on the prairie. There are few more desolate or dreary places on earth to live than a bare windswept prairie home. And none more easily or quickly changed by the planting of trees and shrubs. So make a start to beautify the farm home if you have not done so before. To put some beauty where none was before. What a glorious privilege to be a co-worker with the great landscape gardener of the Universe! As with the wonders of radio we must have our receiving instrument in tune with the broadcasting station if we are to hear the music and singing given out by that station, so we must be in tune with the Infinite if we are to enjoy to the fullest the beauties in Nature all around us. Let us make an effort to plant more trees, shrubs and flowers this coming Spring. For beauty is wealth. Raise a lot of it and be rich.

# Forestry and the National Defense

By Henry S. Graves, Dean, School of Forestry, Yale University

*Col. Graves is well qualified to write on this subject, as he was at the head of the United States Forestry Service before that Nation's entry into the World War. In the Summer of 1917 he went to France as a Lieut.-Col. of Engineers to assist in Forestry matters. In this work he came into intimate contact with the French and British forestry officials and it was largely due to his efforts that French forests were obtained for the operation of United States Forestry Engineers Corps in the Fall of 1917. We are indebted to "The Military Engineer" Journal of the Society of American Military Engineers with headquarters at Washington, D. C., for this article and the plates used in illustrating it.—EDITOR.*

**G**REAT BRITAIN has embarked on a new forest policy, looking to the restoration of the forests which were cut off during the war and also to the establishment of forest plantations upon nearly two million acres of land not heretofore used for growing timber. The policy is primarily one of national defense. While the forests will be of great industrial service in normal times, there will be an element of national security in having a timber reserve large enough to meet the home requirements for fully three years if another emergency should cut off the supplies of forest products from other countries. Great Britain regards this problem of such importance that, in spite of the present financial situation, an authorization of fifteen million dollars has been made to initiate the work of forestry.

On the continent of Europe the service of the forest in national defense has been for many years a factor in the development of the public policies in forestry. While the primary thought has been the supply of wood and timber, the strategic value of forests in military operations has also been given consideration, especially in those countries whose frontiers are exposed to possible invasion. The strategic importance of forests as a cover for the movement of troops, for the concealment of artillery, and as pivotal points in an advance or a retreat, was repeatedly demonstrated in the great war. The French point to the value of the forests of the Vosges in the defense of Epinal and of the Grand Couronné de Nancy in 1914. In the first great German drive in 1914, the forests of Trois-Fontaines near St. Dizier played an important part in protecting the French lines of communication, and in the west the forests of Villiers-Cotterets and of Compiègne enabled the French by a swift maneuver to make a successful attack on the left wing of von Gluck's army. We are more familiar with the second service of the forests of Villiers-Cotterets and of Compiègne, as a cover for the movement of the troops of Marshal Foch in 1918 when he began the great offensive that resulted in the

termination of the war. Many other incidents of the war could be cited to show the strategic value of forests in military operations.

The greatest service of the French forests, however, was in supplying the lumber, round wood and fuel needed by the armies. France has furnished a most conclusive demonstration of the value of far-sighted policy of forestry. For many years the forests have been handled under conservative and scientific methods, both on public and private land. While using the mature timber for industrial

and domestic needs, the total timber capital has been constantly increasing. Not only was there a large aggregate quantity of timber available in the war emergency, but the forests were well distributed throughout the country, readily accessible for use with a minimum burden on the railroads. After the supplies of lumber from Scandinavia, Finland, Russia, and North America were cut off by the submarine and by pressure for tonnage to move troops and supplies, the French forests furnished most of the lumber and wood material needed by all the allied armies in France. Prior to the interruption of shipping by the submarine, Great Britain had imported lumber from other countries both to supply her requirements in France and to meet the various needs at home. The French had drawn upon their own forests for the war needs, and had even been able to send railroad and mine props to Eng-

## Forests--A Vital Resource

By Henry C. Wallace

Secretary of Agriculture of the United States.

**E**VERY civilized nation in the world has come to realize that its national security and prosperity are built, in no small measure, upon a foundation of wood which forests supply. This fact was clearly demonstrated in the recent war, when the forests of France were called upon to supply the materials so essential to the success of the Allies. Only the far-sighted forestry policy of that nation made it possible to meet this demand. Forests are a prerequisite not only in the defense of a nation, but also in its economic and industrial upbuilding. The recent demands of the French for control of the German forests emphasizes this fact. But America has not yet fully awakened to the seriousness of its own forestry problem, which includes in part the elimination each year of thousands of man-caused forest fires, the reforestation of waste land suited only for the growing of trees, and the highest use of the remaining virgin forests of our country. With the awakening of public conscience and the solution of these problems will come a new era of prosperity and security based on the knowledge that these United States are, and always will be, self-sustaining in the production of this most vital resource—wood.

land. About the time of our entry in the war, the British turned to the limited forests of England and Scotland. Lacking a skilled industry to exploit them, battalions of lumbermen equipped with portable mills were brought over from Canada. Ten sawmill units were also sent from New England to operate in the Scottish forests. It did not take long to exhaust the British forests, though the private owners readily offered their woodlands and even the park trees upon their estates. It was then that the Canadian forestry troops were transferred to operate in the French forests.

One of the early requests of the British for American



United States Soldiers laying track in the spruce forests of Washington

assistance in the Spring of 1917 was for a regiment of forestry engineers to work in the French forests to supply lumber and other wood products for the British army. It was this request that led to the organization of the 10th Engineers (afterwards incorporated with the 20th), though the needs of the American army made it impossible to give the British the promised aid until 1918. A similar request was also made by the French for about 5,000 men, because they lacked the personnel and equipment to meet their current needs for wood products.

The American troops were at first greatly embarrassed because of the lack of lumber and other wood materials. Our first needs were for barracks, storehouses, and other buildings, for railroad ties, for piling and lumber for docks, for telegraph and telephone poles, and for fuel. The allied armies did not have the skilled men and equipment to produce the material really required for their own needs, and the small quantities of lumber, ties, poles, piles and cordwood furnished the American army were given at a real sacrifice. The French placed their forests at our disposal, although they were able to offer but little manufactured lumber or even dry fuel. Necessarily, some time elapsed before the forestry troops and their equipment could be transported to France. Every one who was there during the Summer of 1917 will recall the difficulties resulting from the inability to obtain wood materials.

The work of the 20th Engineers (which absorbed the 10th), under the admirable leadership of Colonel J. A. Woodruff, Corps of Engineers, is well known to the entire American army. The operations of these troops supplied most of the wood material used for construction and other purposes in the rear; they provided also the large quantities of material needed at the front for construction, shelter, ties, poles, trench material, pickets, road plank, etc. To produce the required material it was necessary to ship to France not only a large number of sawmills but all the logging equipment, from axes and peavies to logging wagons and trucks. At the close of the war there were in progress 90 operations in the French forests. These comprised 81 sawmills, most of which had been shipped from the United States. Nearly 12,000 technical engineer

troops and 8,500 service troops were engaged in this work. Fuel operations also were conducted at the front by quartermaster troops. Thirty officers from the 20th Engineers were loaned to the quartermaster corps to aid in this work.

The early estimates of the needs of the American army in France called for about 25 million feet of sawn and round material each month, in addition to fuel. At the time of the armistice, the needs were estimated at nearly 75 million feet a month. To meet these needs and for possible greater requirements, additional companies of forest engineers were being recruited when the armistice was signed, and orders were being placed for many more sawmills and for an immense quantity of logging equipment.

The production from the American mills constituted a record in the history of lumbering. The production of over 160,000 feet of lumber in 24 hours from a mill classed as having a capacity of 20,000 feet for 10 hours was previously unknown. But a similar rate of production was achieved by a number of Colonel Woodruff's companies. The total quantity of material produced by the mills operated by the American troops aggregated about 300 million feet of lumber and ties, in addition to nearly 3 million piles and poles of various sizes. This was a fine achievement when one considers the local difficulties, the relatively small size of the timber, and the necessity of operating small tracts and of making transfers of the mills to new points of operation.

Of special interest is the work accomplished in furnishing fuel wood for the American army. Fuel operations were carried on both within the zone of the armies and in the rear. Altogether there had been produced by the forestry section about 400,000 cords of wood for fuel when its work was completed in 1919.

France had over 1,250,000 acres of forest practically devastated in the zone of fighting. At the close of the war there were fully 50,000 forestry and engineer troops, French, British and American, operating in the forests in different parts of the country. Yet there remained considerable areas which had not been cut over and in case of necessity some of the forests from which only the

largest trees were removed, could have been cut more heavily with very substantial production. Over a century of careful forestry created this condition and provided the material that was so essential in the engineering work in France. It is not pleasant to contemplate what the situation would have been if the French had been as indifferent to a proper forest policy as are we in the United States.

Most of the discussion of the war uses for forest products has been centered on the needs of the armies in



Logging in the Oregon forests

France. Great as these were, they aggregated only a fraction of the requirement in this country for temporary buildings, for boxes, crates, and other containers, for ships, for the manufacture of war vehicles and implements of all sorts, for chemical products of wood, and the like. The total quantity of wood products used for war purposes aggregated no less than 8.5 billion board feet, not including the requirements of the railroads for cars, bridges, cross ties, and miscellaneous uses, which amounted to about 4.5 billion feet more. The following table, from material compiled by the U. S. Forest Service, indicates as closely as can be determined, the amount of wood material used in the United States for war purposes:

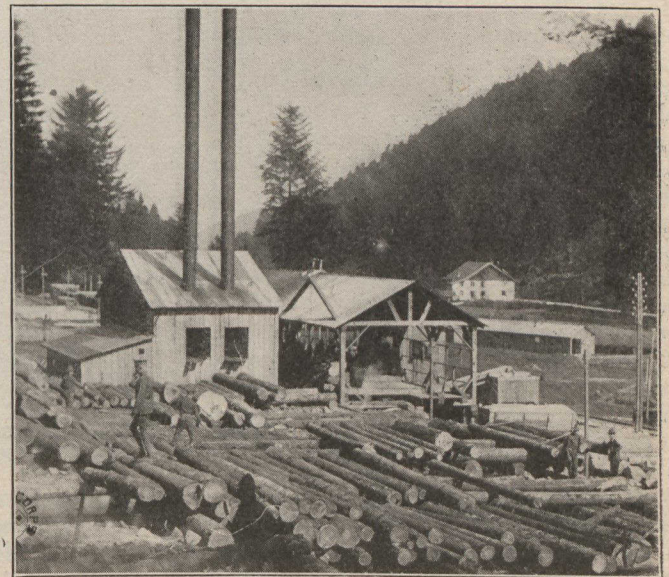
	Board Feet.
Army Requirements.....	6,037,859,000
Navy Requirements.....	309,197,000
Shipping Board and Emergency Fleet Corp.....	1,691,500,000
Allies.....	660,094,000
Railroads.....	4,500,619,000
<b>Totals.....</b>	<b>13,199,269,000</b>

A complete analysis of the lumber requirements of this country during the war would be beyond the scope of this article. Certain features, however, are of interest as showing the future problems of forestry in a plan

of national defense. The war uses of wood products by the army were as follows:

	Board Feet.
Construction.....	2,973,000,000
Boxes and Crates.....	2,555,00,000
Vehicles and Artillery Wheels.....	116,000,000
Gun stocks.....	94,832,000
Aircraft.....	45,672,000
Implements.....	24,000,000
Miscellaneous.....	229,355,000
<b>Total.....</b>	<b>6,037,859,000</b>

The great quantities of softwoods needed for construction and other purposes were furnished with reasonable promptness. It was possible to meet this emergency because we still had in the east a certain amount of virgin forest and a well-organized lumber industry. It was the large mills operating in bodies of heavy timber that made possible a large production of the soft wood lumber needed at once. If the war had taken place fifteen years later, we could not have accomplished what we did, because the virgin supplies of the east would by that time have been largely exhausted and the large mills will be a thing of the past. The seasoning of wood offered a perplexing problem, especially with high grade hardwoods. It was possible to use lumber for construction and for most containers without seasoning, but this could not be done in manufacturing vehicles, implements, and aircraft. Ordinarily the material used for these purposes had been air-dried. Some lumber can be dried in six months to a year. Thick stock of oak suited for artillery wheels requires two or sometimes three years for proper air-seasoning, while it can be seasoned by dry-kiln methods in ninety days. It was necessary to install a great deal of new equipment and to train men to use it. One concern manufacturing gun stocks lost 60,000 blanks by using improper specific-



Sawmill at Camp Weed, United States Engineers, near Bruyers, France, July 1, 1918.

ations for drying. The Forest Service was able to assist the army and navy in formulating specifications for seasoning, and to aid the manufacturers in the development and operation of new dry kilns.

The existing lumber industry backed by substantial bodies of virgin forest was able to provide the ordinary grades of lumber. Greater difficulty was encountered in the case of specialized material such as high grade ash, oak, hickory, walnut, and locust. The Government,

(Continued on page 180)

# SILVICULTURAL RESEARCH IN CANADA

By Roland D. Craig, F. E.

**I**N the early stages of man's development he lived a nomadic life, continually moving his abode from place to place as he used up Nature's resources on which he depended for his sustenance. It was not until he learned to reproduce and cultivate these resources that he settled down and began to build up industries and social organizations on a permanent basis. The meagre historical records of these times do not ascribe any reason for his domestication, but it can be inferred that competition among tribes and the failure of natural supplies were responsible.

The forest industries have followed much the same course of evolution. In North America virgin supplies of timber have been abundant and, as they were cut in one region, the manufacturing plants could be moved to new sources of supply without great difficulty. We have now, however, arrived at the stage where virgin timber is more difficult to secure and, when secured, is more costly to exploit and we are faced with the necessity of developing methods of reproduction and culture of our forests if their productive capacity is to be maintained.

The migration of these industries from place to place is economically wasteful, not only from the standpoint of the industries themselves, but to the communities which grow up about them and depend on them for their support. This is especially true in the case of pulp and paper plants, which entail very large ex-

penditures for the development of power and the construction of buildings and employ large numbers of men.

That it is unnecessary to be dependent on virgin supplies of wood has been demonstrated in many of the European countries where, after centuries of use, the forests are more productive than ever. It has been

wood, it is essential that we manage our forests so that they will be as productive as possible. In other words we must practice silviculture. Silviculture, like agriculture to be successfully applied requires a scientific knowledge of the natural laws governing the growth of the crops desired. The need of this basic knowledge as applied to agriculture,

has been recognized in Canada for many years and agricultural research is receiving generous support. The Dominion Government devoted \$1,315,000 this year to the Experimental Farms for the maintenance of 21 experimental farms, 5 substations, 8 biological laboratories and about 100 illustration farms, which with the exception of the latter, were practically entirely engaged in agricultural research. In addition, the other branches of the Dominion Department of Agriculture and the provincial agricultural de-

## AN EXPERIMENT IN CLEAN CUTTING



**Black Spruce, tops lopped but not burned, to find out whether natural reproduction can be secured in this way.**

claimed that we can depend on Nature to reforest our cut-over lands, but without guidance Nature cannot be expected to provide the kind of trees desired nor to maintain the maximum production of forest crops any more than she can in the care of field crops. She may clothe the prairie with grass but she does not, without assistance, produce timothy hay yielding three tons per acre.

### Must Be Manage Economically

Since we will shortly be dependent on what is popularly known as "second growth" for our supplies of

partments carry on considerable investigation of agricultural problems. Forest research has, as yet, received scant consideration in Canada, in spite of the fact that the forest industries rank next to agriculture in importance in this country. It is only during the last few years that the Commission of Conservation and the Dominion Forestry Branch have been able to make a beginning on a study of the silvical problems of Canada. This year, the Forestry Branch secured \$35,000 for this purpose and, though considerable work was accomplished, the field is so large and

SILVICULTURAL RESEARCH IN CANADA



Sample Plot in dense Red and White Pine where the effect of thinning on the rate of growth is being studied

the need for knowledge so great, that it has been possible to undertake the study of only a very small portion of the problems confronting foresters. Among the more pressing subjects concerning which definite information is required are:—

1. The extent and nature of our present forest resources.
2. The areas from which future supplies may be secured.
3. The conditions necessary for the reproduction of desirable species, either naturally or by artificial means.
4. The methods to be adopted to secure the best growth of these species on various sites.
5. The length of time it will take to produce merchantable timber under the various conditions.

In connection with the study of these problems there arises the necessity of other investigations, such as the methods of measuring standing timber and the rate of growth.

Silviculture differs from agriculture in one important point, and that is the time it takes to produce a crop. The long time required to grow a forest or to produce a reaction to

treatment necessitates waiting for years for results of silvicultural experiments. This makes it more imperative that no delay should occur

in getting the research projects under way.

Silvicultural problems, like agricultural problems, must be studied locally. The knowledge gained in other countries may be a guide, but the varying conditions of climate, soil and species preclude the formulation of plans of management which can be applied universally. The forests of Canada are so varied in type and the species throughout most of the forested area are so intermingled that the very extensive investigation is necessary to determine the best practical methods of management. The forest industries of Canada will never be placed on a permanent basis until the forests are treated as growing crops and put under intelligent silvicultural management which can only be done when the basic knowledge has been acquired. There is no reason why with the immense areas of forest land there are in Canada, we should ever have to curtail our production. On the contrary, we should be able to very greatly increase the output of our forests by intelligent handling.

SILVICULTURAL RESEARCH IN CANADA



Sample Plot on Cut-over Black Spruce Land on which the slash has been burned to study the effect on reproduction

Send your friend, at home or abroad, The Illustrated Canadian Forestry Magazine as a reminder each month of your thoughtfulness and good judgment. Send your name or names of those you desire to remember in this way, in to this office and they will be fittingly informed of your thoughtfulness.



# The Forests of British Columbia

Some Fanciful Facts  
and Plain Figures  
Concerning Tree Resources  
of Pacific Coast Province.  
--By Irene Todd--



COME with me in fancy to the forests of British Columbia. They are magnificent forests of cedar, fir, cottonwood, spruce, pine, hemlock and balsam that grow here on the Pacific slope in Canada's most westerly province. They are quiet, cool and fragrant—beautiful to behold. They cover almost the entire province save where the mountains raise their heads above the limit of tree growth or where clearings have been made for agriculture or for cities. Therein are firs and cedars, beside which those famous firs and cedars of Lebanon, brought down by old Hiram, King of Tyre, for the building of Solomon's Temple, would seem almost insignificant. And all who enter their stately precincts and walk in quietude among the huge pillars of living timber receive some message and some inspiration.

The artist finds in the various and beautiful groupings of the trees and the peculiar effect of light and shade as the sunlight filters through the swaying branches, scenes of quiet beauty to reproduce on canvas and pass on to the multitude. The dreamer standing among these monarchs of the forest, beside which man seems like a mere pigmy, takes a fond delight in thinking of the wonderful part trees have had in the making of history and literature throughout the world, how often trees of various kinds are mentioned in all literature from Biblical times to the present. He recalls how the oak tree has been woven into the very warp and woof of British history and how certain woods like teak, mahogany and walnut have become famous throughout the world and so on and on, for the subject of trees and timbers is almost inexhaustible. But when the hard-headed business man enters these forests he thinks of the trees, first and foremost, as so much merchantable timber. He hears the axe blows fall, the saw sing, the machinery of the sawmill and pulp plant hum. He sees endless piles of building lumber,

planks, beams, railway ties, telegraph poles, ship-masts, lath and shingles, great bundles of pulp and enormous rolls of paper. All this represents to him millions of dollars in hard, cold cash. Then, because this is a practical age and the artists and dreamers are few, let us deal with our subject from the business man's point of view, from the economic side.

Now, the forests of Canada's Pacific province represent 366,000,000,000 board feet of merchantable timber or approximately one half the saw-timber of the whole Dominion, but the practical man, who knows nothing of the forests immediately asks "What kind of timber is it and what are its uses?" Very well.

## The Douglas Fir.

The most valuable tree found on the Pacific Coast is the Douglas Fir, which ranges from the Rocky Mountains to the coast as far north as 51°. It is the giant of the forest, a mighty tree indeed, attaining its finest proportions along the coast where it sometimes towers to a height of 300 feet with a base circumference of 30 to 40 feet. The best trees, however, for commercial purposes run 100 to 150 feet clear of limbs and are from 4 to 8 feet in diameter. For its weight, it is the strongest wood in the world that is obtainable in structural sizes and quantities. While moderately hard, it is easy to work, is straight-grained, tough, resilient and durable. It takes stain well, and can be given a beautiful finish. In color it varies from a straw-yellow to a reddish brown.

The great strength of Douglas Fir along with its comparatively light weight makes it an ideal timber for heavy structural work. The tallest single stick flag pole in the British Empire, which stands in the centre of Kew Gardens, London, England, and is 240 feet high, 48 inches square at the butt and 24 inches at the top, was made from a Douglas Fir from

British Columbia. It is equally valuable indoors and out and is used to a greater extent than any other wood by the sash and door manufacturers of British Columbia. Sawn flat-grained, it shows a beautiful and distinctive figuring making it very attractive and widely used for panelling and other interior finish.

## The Red Cedar.

The next tree in importance is the Western Red Cedar. It is the largest of all the cedars, averaging 125 feet in height with a diameter of 4 to 8 feet, but sometimes growing to 200 feet, with a diameter of from 14 to 18 feet. This wood is exceptionally light, soft and of close straight grain, making it easy to work and rendering it remarkably free from warping, shrinking or swelling. The narrow sap wood is white. The heart-wood in mature years is generally a brownish-red, growing deeper and richer with age. Long, long ago, when the Indians of the North Pacific Coast used to carve and erect their famous totem poles, they chose the British Columbia Red Cedar because, while easily worked, they knew it would outlast generations of Indians, and many of the totem poles may still be seen to-day at Alert Bay, Bella-Bella and other Indian villages passed while cruising from Vancouver to Prince Rupert. The Haida Indians of the Queen Charlotte Islands also used this wood for their great war canoes and the qualities which the Red Man found in it, make it the great shingle and siding wood of the North American continent to-day. Western Red Cedar is more widely used for poles than any other wood without preservative treatment, because of its great durability in contact with the damp soil and in all kinds of weather. Its beautiful colouring and its distinctive silky finish render it most effective in beam-ceiling-wood, while the pleasing aroma of the wood, which however, is distasteful to moths, makes





B. C. logs make a comfortable home. A fire warden's cabin deep in the woods.

it invaluable for clothes chests, closets, etc. Its chief use, however, is in the manufacture of the famous B. C. shingles.

#### The Western Hemlock.

The Western Hemlock comes next and is an altogether different tree from the Eastern tree. The cool moist climate of the British Columbia coast provides conditions necessary for its best development and here it reaches a height of from 125 to 150 feet with a diameter of 2 to 5 feet. The wood is light, fairly strong, tough, straight-grained and also does not splinter. It contains no pitch or resin and is usually light in colour. It is well suited for all but the heaviest kind of construction work, being manufactured into all the common forms of lumber and used for much the same purposes as Douglas Fir. Its principal use at present is for pulp.

#### The Sitka Spruce.

Sitka Spruce, the monarch of the spruce family, is another important tree. It grows only on the Pacific Coast, the mature trees averaging a height of 150 feet and diameter of 4 feet, while trees towering to 200 feet are not uncommon. The wood, while unusually white, soft and light, is tough and very strong for its weight. It is even-grained, long-fibred, easily-worked, non-resinous, odourless, tasteless, flexible and resilient and does not warp or split. During the Great War the forests of British Columbia provided enough

Sitka Spruce in ten months for the construction of 2,000 aeroplanes. The greater part of this was logged on the Queen Charlotte Islands, where Sitka Spruce is found at its best. Its long straight grain and fibre, fine texture and its resilient quality, when cut in thin boards, especially fit it for use in the manufacture of piano sounding boards and stringed instruments. Although unsuitable for heavy structural work there are many building uses for which it may be used.

It makes excellent stock for light construction and interior finish. It is also an excellent wood for the manufacture of paper.

#### The Yellow Pine.

Western Yellow Pine is irregularly distributed over the southern interior of British Columbia between the eastern slope of the Cascade Mountains and the western slope of the Rocky Mountains. The trees reach a height of from 60 to 100 feet with a diameter of from 2 to 4 feet. The bark is 2 to 3 inches thick and reddish-yellow in colour, while the slow even growth of the tree produces wood of fine grain and quality. It is soft, light and strong in proportion to its weight, works easily and smoothly without splitting and readily takes and holds paints, stains and varnishes. Its similarity to White Pine renders it difficult to tell the woods apart. It is manufactured into the same products and used for practically the same purposes as White Pine.

#### The Western Larch.

Western Larch, like Western Yellow Pine, is found between the Rocky Mountains and the Cascade Range, and like most of the trees of British Columbia is the largest of its kind in the world. Mature trees grow from 100 to 150 feet high, with a diameter of from 3 to 3½ feet, with a straight smooth trunk. The heartwood is bright reddish-brown in



A dense growth of Lodgepole Pine in the Forests of B.C.

colour, while the sap-wood, which is usually from  $\frac{1}{2}$  to  $1\frac{1}{2}$  inches thick is yellowish-white. The wood is hard and strong, holds nails firmly and does not split easily. Its uses range from the heaviest wharf and bridge construction to the finest interior finish.

#### Some Other Varieties.

We have now dealt with the chief commercial woods of British Columbia individually, but not by any means with them all. Other trees of commercial value manufactured in the Province are Engelmann Spruce, Cottonwood, Lodgepole Pine, Western White Pine and various species of true firs or balsams. In the old days all the soft woods were treated with the same stain as the hard woods, but at last wood-workers have come to realize that these soft woods have a peculiar and distinctive beauty of their own, which must be brought out by a special treatment, and they are now giving special attention to their finishing so that at the present time they are acceptable for interior finish in the finest public buildings and private residences.

#### Value of the Industry.

So much for the kinds of trees and their uses. Now, to turn these trees into marketable lumber means a great industry within the province, employing thousands of men. The value of this industry in 1920 amounted to \$92,500,000. There were 567 logging firms in operation, giving employment to 11,250 persons, 385 sawmills employing 12,645 persons, 60 planing mills providing work for 2,000 people and six pulp and paper mills with approximately the same number of employees.

During 1921 the industry increased considerably. More logging camps were opened up, the old pulp and paper mills were running to capacity; new enterprises launched; the shipments of paper to other countries, notably to Australia, instead of the raw pulp, did much to increase the activity of industry; the export of lumber to the eastern states and Quebec via the Panama Canal was inaugurated and new outlets were found for the boxes manufactured in the province.

The lumber export trade of the Canadian Pacific Coast, the last great reservoir of standing timber is rapid-

ly increasing, more than 156,000,000 feet having gone out of British Columbia to foreign countries during 1921. The total to the first of September was in excess of 100,000,000 feet. September and October added 30,000,000 feet and November and December more than 25,000,000 feet. This does not include the large quantity of box shooks and shingles nor the amount exported by rail to the United States.

The majority of this lumber outside of what went to the United States and the United Kingdom was shipped to Australia, China, Egypt, India, Japan, New Zealand, South Africa, South Sea Islands, Straits Settlements, Hawaiian Islands and the Phillipines. One initial order this year came from the Egyptian Government for 7,700,000 feet of railway ties. From six to eight million feet have left each month for Japan; South Africa sent one order for 1,400,000 feet alone, whilst an order for 3,500,000 feet came from Chile.

Yet with all this activity and export trade, the forests of Canada's Pacific Province with proper conservation methods can supply lumber for year after year to come, and still have enough and to spare.



A huge section of Sitka Spruce in B.C.

# Building Population by Building Forests

As a Fashioning Factor of the Human Race They are Unexcelled

By Dr. Clifton D. Howe,

Dean, Faculty of Forestry, University of Toronto

In two parts—Part II

SEVERAL indirect influences of the forest are important in the development of the community. Thirty or forty years ago the greater portion of forestry propaganda concerned itself with the beneficial effects of forests upon climate and streamflow. Then followed a period in which it was believed that data in this regard had been misinterpreted and exaggerated. But now the pendulum is beginning to swing toward its original position. The extraordinary devastation that has taken place in the past two decades in which not only the forest has been removed, but in many cases the soil that bore it, has led scientists to re-examine their data with the result that many now believe the forest does exert a beneficial influence upon the humidity of the air in adjacent open areas, that the forest cover regulates drainage and the flow of streams. There are many evidences of this in Eastern Canada in the drying up of wells and streams. These may be transformed from intangible to very tangible influences upon the community, when they modify waterpowers, the navigability of streams and crop production.

## Forest Influences are Great

An increasing number of people visit our forests and forest parks each year for recreational purposes. This influence of the forest in giving renewed health and vigor to thousands cannot be measured. And they give more than this. They give a point of view, a philosophy of life that is beyond price to the community. It is the green forest that people love, not the burned and fire scarred. We hear no more common regret among tourists and campers than that such and such lakes have been spoiled for their purposes by forest fires. It seems to be the ultimate fate of most of our forest areas that they shall be burned. If this devastation goes on, the playground function of the forest will largely cease, and the penalty in weakening the moral fiber of the community will be great.

Let us return now to the consideration of the treatment of our forests. The natural forest soils and the intermediate soils in Eastern Canada probably comprise some 150 million acres and they far surpass in extent the purely agricultural soils. Much the greater portion of our timber and pulpwood has come from soils of the above mentioned classes, yet in Ontario at least they are cut under a system designed for agricultural development after the lumberman had finished his work and in no Eastern province is there an adequate provision on the part of the government for the re-establishment of the forest removed by the lumbering operations. The results of such a policy, already being acutely manifest in Eastern Canada, are as inevitable as they are logical.

## Adequate Program Needed.

It is far from my intention to belittle the splendid work in forest planting now being carried on by certain pulp and paper companies, nor the magnificent program of reforestation now in operation at the instigation of the Ontario government, nor the results of a fixed diameter limit in cutting operations as enforced by the governments of Quebec and New Brunswick. They are however only subordinate parts of a really adequate and effective forestry program. By an adequate forestry program I mean one that will keep our forest lands continuously productive in terms of commercially valuable trees. An effective forestry program for this country can never entirely depend on the planted product of worn out agricultural soils or of burned out forest soils; its broad foundations must ever lie in and rely upon natural forest soils as maintained in the forest. Forestry to be successful should chiefly concern itself with forests, not with barrens. The fixed diameter limit, in spite of some advantageous aspects, does not insure the regeneration of commercial species — and such regeneration is fundamental in an adequate forestry program.

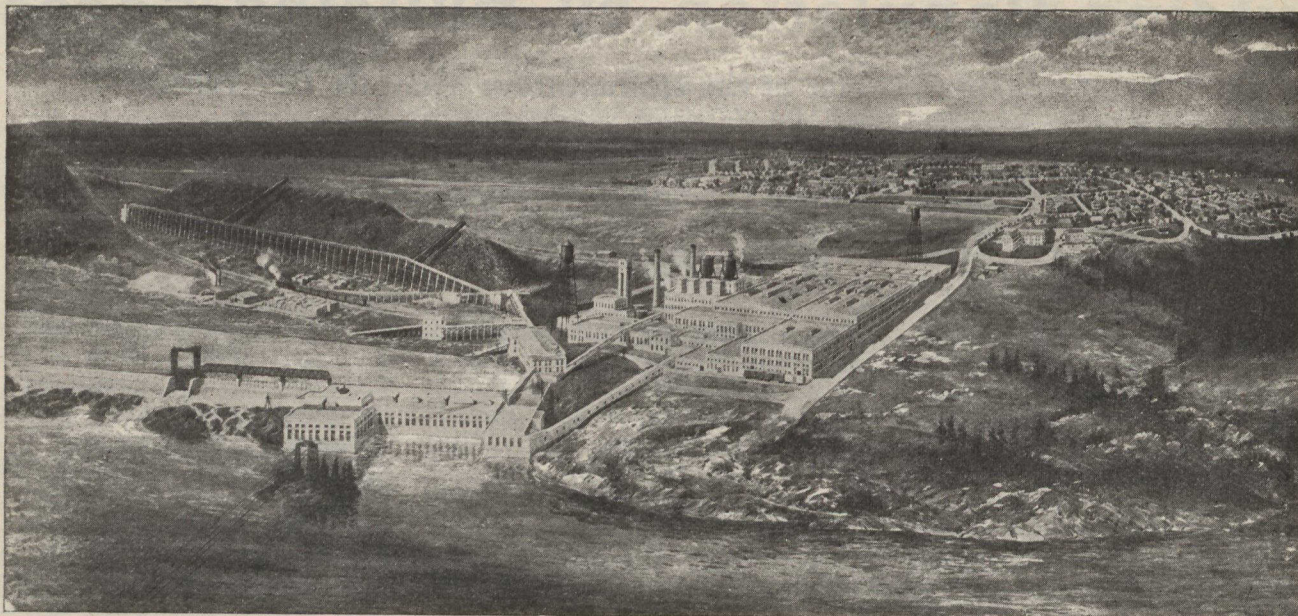
We can, if we wish, let matters run on under their present momentum until they exhaust themselves. We can calmly watch the passing of spruce as we have watched the passing of white pine as a leading lumber product. We can sit back and take only what nature undirected may give us, just as the farmer might have done and just as the manufacturer might have gone on without improving his processes. We can, of course, use inferior woods. We can furnish our houses with slats sawed from poles and saplings; we can make paper of willow shoots or even of grass. Such arguments, however, are not worthy of Canadians. They indicate a vision on a par with that of the men who forty years ago argued that the Western prairies were little better than deserts and would never support a farming population, or the men who twenty years ago claimed there could be no rich ore deposits in northern Ontario because the rock strata was not the proper kind, or the vision of the men of more recent date who claimed that aircraft could never be successfully used for aerial fire patrol or for forest mapping.

## Men of Vision Needed.

No, the arguments of the timid have never prevailed for long in Canadian councils. The history of Canada is largely the history of men of vision who had faith in their vision and worked for its accomplishment unceasingly. It is as true today as in the days of the early French explorers, or in the time of the struggle for responsible government, or the days of the confederation fathers; it is true of those who settled the prairies, who developed the mines, and of those who built up the great lumbering and pulpwood industries.

I feel confident that the same quality of vision will be displayed in the co-operation of the lumbering and pulp and paper interests and the government in bringing about an effective forestry program based upon an adequate regeneration of the commercial species as a result of the

## AN ILLUSTRATION OF THE PART FOREST PRODUCTS PLAY IN BUILDING COMMUNITIES.



Plant and Townsite of the Abitibi Power and Paper Co.

The power of the Canadian forests in developing a prosperous community out of areas that yesterday were wilderness is well exemplified in the case of Iroquois Falls, the mill town of the Abitibi Power and Paper Company, situated on the T. & N. O. Railway in Northern Ontario. Just a few years ago the town-site was a tree covered slope. The water-power represented merely a potential asset and the hundreds of miles of timber to the north and east and west stood only as a myriad of trees, a dormant factor in national development.

Our possession of Canadian forests and water powers has been able to attract to the former "wilderness" at Iroquois Falls an investment in excess of \$30,000,000.

Two thousand people now inhabit the beautifully laid-out town, attractively boulevarded, with 225 modern homes well spaced out and maintained in excellent condition. In the adjoining town of Ansonville about the same number of people reside and all are directly dependent upon the operation of the mill for a livelihood. It cannot be too frequently stressed, however, that a paper mill is merely the "agent of the forests" and that the real menace of forest fires is not to trees or log piles, but to human employment and industrial solvency.

The Abitibi mill, in turn, contributes to the prosperity of the Temiskaming and Northern Ontario Railway, (which is a public-owned system), by delivering to them 400,000 tons of freight a year.

The pay roll at Iroquois Falls is in excess of \$200,000 a month.

logging operations. Such a program would naturally vary with varying conditions, but its general principles would be of uniform application. In justice to the operator, it, also, should be of uniform application in all the Eastern provinces or at least for each class of products competing for the same market. An effective forestry program would doubtless restrict somewhat the present methods of cutting which would mean that the cost of the product would be higher, but the public would be the beneficiary of a sustained yield and, therefore, it would be reasonable to ask the public to pay for it in higher prices for lumber, pulp and other forest products. The prices under an adequate, controlled yield, however, would be more uniform and cheaper for the public in the long run than the

inevitable panic prices under the knowledge of vanishing supplies. The public must pay for the security of sustained supplies from the forest just as the individual pays for security from loss of life or health or loss from the destruction of his buildings from fire. The sooner the public understands this, the better for all concerned.

Under an adequate forestry program we could meet our present demands indefinitely, or in other words our present half billion dollar business in forest products could be maintained each year so long as the sun shines and the rain falls. Is not that an object worthy of a great deal of thought and effort, especially when we know that under the present treatment of the forest the lumber and pulpwood business can not be main-

As is the case with many of the pulp and paper communities the responsible corporation was obliged not only to construct the paper mill, but to plan and build the entire municipality. Conditions of living necessarily had to be made attractive in order to induce the best class of workmen and executives to reside in what might be considered "out of the way" places. In this manner the company retained control of the types of dwellings and wisely insisted upon quality homes in keeping with the quality product of their huge factory. When a workman takes up life at Iroquois Falls it is the very opposite of primitive discomfort that he encounters for even the humblest home is equipped with hot and cold water, baths, furnaces and electric light.

With consistent courage and initiative the Abitibi Power & Paper Company built, last year, a logging railroad at an expense of approximately \$750,000 for bringing logs to the mill during the Winter season. This was a good deal of an innovation in Eastern Canada and a decided departure from the old system of driving logs by water. While this road has only been in operation two months the result to date has been fully up to expectations. The huge plant at Iroquois Falls represents the largest individual newsprint mill in the world with a capacity of 500 tons a day requiring approximately 750 cords of wood for each day's operation.

"The Canadian Forestry Magazine" intends to reproduce in successive issues photographs of the leading pulp and paper towns of Canada with a brief description of the community created as a consequence of the existence of contiguous timber supplies.

tained at its present level very much longer?

There is another consideration. We are growing rapidly in population and will undoubtedly consume larger quantities of forest products — a probable increase which our forests will be absolutely unable to supply if present methods are continued.

There is still another consideration. Our outside markets are growing. In fact, they already consume a very large portion of certain products. Why not prepare for extended markets in the future, or in other words, why should not this country go into the business of raising forest products to compete in the markets of the world, as well as wheat, beef, butter and cheese for the same purposes? Nature could hardly have done better

(Continued on page 191)

# Will a County Forest Pay?

By Harold Cahill Belyea

Graduate of the University of New Brunswick, at present Assistant Professor of Forest Engineering, New York State College of Forestry, Syracuse, New York.

**W**HY NOT county forests? Forest production is essentially a public enterprise just as forest use, whether in product or in actuality, is a community enjoyment. It must be remembered that forest production is not a short time proposition and as such is neither attractive to private investment nor capable of its highest development through private endeavour.

Forest production requires for its fulfillment a period of time compassing often in the period between the initiation of the forest crop and its harvest usually more than the allotted span of man's life. The results of forestry practice are indefinite and if the practice be on a basis of continuity, the results are permanent and sustained. Such results are both direct and indirect. Direct, in that the practice of forestry yields direct profit and revenue to the owner; indirect, in the economic benefits and advantages they give to the community at large. Forests designed for the production of timber, may be utilized for camping, hunting, fishing, public playgrounds and other forms of forest recreation long before the timber is large enough to cut. Nor, in a well managed forest, need the factor of cutting, occasion any check in the continuity of such recreational use.

The evil of private industrial development of forests has been the exploitation and abandonment of forested areas. Why shouldn't municipalities, counties, give permanence through public ownership to industries which through their existence add to the collective wealth and property of the community. Established forests, permanently established and managed forests mean established industries, established homes, established villages and communities. Who then is the chief benefactor other than the county in which they are located.

## Location and Development.

According to definition, forests should primarily occupy lands not suited for agriculture. This may be stony, rocky hillsides too rough or too steep to plough. Soils which are too



A planted White Pine forest will yield approximately 7 per cent. per annum with maturity at 40-50 years. This picture shows a planted White Pine forest, 42 years old with a merchantable volume of 23,230 board feet per acre, a net sale value of between \$450.00 and \$500.00 per acre.

dry or too wet, too sandy or too heavy, too shallow or too rocky, upon which to grow a farm crop, may be considered as true forest soils. There are run down farms in every community, abandoned by their owners which answer this description. If a man is habitually lazy and idle, unable and unwilling to support himself or contribute to the support of others, we invoke the vagrancy law and put him to work. There are in every community abandoned farms. These lands which contribute nothing through taxation to the support of the community and its progress are true vagrants. Each and every acre is a loafer, since in its natural reversion from agricultural to forest condition is accomplished slothfully and wastefully. "Put the loafing acre to work" is a slogan that might be adopted by every municipality. If it cannot be farm land, make it a forest. If it isn't reverting to forest land in the way it should naturally, make it a forest artificially. If it is a forest, make it a better forest, capable of yielding the best re-

turns possible on the acre. Put the loafing acre to work and — make it work.

Whether it be a soft woods forest, Pines, Spruce, etc., or a hardwoods forest, depends on circumstances. The softwoods forest, on the whole all through Eastern Canada grows faster, is more easily managed and yields better returns to the acre than the hardwood forest. The easiest method of establishing such a forest is by planting the land to pine or spruce. If there is a good growth of hardwoods on the site, it is better to promote the best growth of the hardwoods and make a conversion to softwoods by degrees; planting up clear cut areas until the whole process is complete.

The public forest should neither be too large nor too small. It should be of such size to permit of the easy application of a full plan of management. To permit of an efficient application of such a plan, the area of a forest should rarely exceed 1,500 acres nor be less than 200 acres. While a general compactness is desirable for forest management, in a rural community it is believed that the best interests will be served by not having it too compact. Fully as good results will be gotten from a number of medium sized blocks of timber land as from the large block. It is not believed advisable that parcels smaller than 20-30 acres should be handled as part of a forest working unit. Such small parcels should be sold or an endeavor made to compact the area into larger blocks.

A point which must not be lost sight of in the location of public forests is that of their accessibility. It is to be remembered that the word "public" implies a community enterprise, one in which every member of the community has or should have an interest. The perpetuation of public forests as such, and the continuance of a good sound forest policy depends upon the sustaining of good live public interest. Place the public forest where it cannot be seen, put it in the back country where bad roads make the forest hard to get to, and the public interest will wane and die.

While the public forest is to be mainly devoted to the production of



Careful management will change an apparently worthless woodlot into a valuable property. This picture shows a natural growth of valuable coniferous trees being managed and produced under a mature hardwood stand.

timber, the recreation factor, which is one of the strongest sentiments in arousing the public interest and support, must never be lost sight of. The lover of woodland, the camper, the hunter or the fisherman should be the strongest supporters of a sane forest production policy, and any plan of management should be based and carried out with a view of properly protecting the recreation phase. To this end, public forests should be located where they are fairly easily accessible, and their right use in recreation should be encouraged.

Another point to be urged in the locality of the public forest in accessible places is that of stimulating public interest and pride. The interest of a community can always be kept up in a forest project which every resident of the town or country is familiar with by actually being able to see its development and growth.

Finally there is the factor of economics and financial returns. The more accessible the forest to mortals and shipping points, the better and shorter the road haul between the stump and the point of shipment, the cheaper the timber can be logged and

the greater the financial returns to be expected. It is to be remembered that a public forest is a demonstration forest, and as such, must not only demonstrate the growth of trees and of forests, but also the growth of forestry sentiment in the community. To this end the public forest should be located in places where it is utilizing to its highest development non-agricultural land, where it is easily accessible to the recreationist, where it can easily, readily and always be seen to the stimulation of public pride, and public interest, and where it can most easily be harvested with the maximum of profits and returns.

#### Management.

The main points essential to remember in the management of the county forest are:

1. That it should be composed of the most desirable species, species suited not only to the climate and to the soil, but species suited also to the local market conditions. No farmer, for example, will attempt to grow alfalfa in a vineyard country. He has little or no market and he can't get

away with it. Similarly the forest should be managed with an eye to its markets. No sane plan of management, for example, would attempt to grow hardwood timber in a box shoo district. The demands of the local market must be carefully studied and the plan of management adopted to it.

2. The individual trees of the forest must be all clear and sound. It is more than important that the trees shall display a good height growth for their age as well as a good diameter. They should be tall, full, clear, or free from limbs, except near the top. All of these factors lessen the market value of the lumber, and the plan of management must always seek the removal of the poorer and decadent individuals and the development of the superior members of the stand.

3. The trees should be sufficiently close together to maintain a good crown cover to keep out sunlight from striking the ground and drying out the soil and soil cover.

4. The soil should be well shaded, moist and mellow promoting the healthiest and most rapid growth of the stand.

**Rotation.**

By the rotation age is meant the number of years elapsing between the initiation of the stand and the harvesting of the mature crop of timber. Its length varies with the speed of growth of different species, with the market demands for different sized timber.

Softwoods as a rule are quicker growing than hardwoods. White Pine, for example, should be managed on 40-50 year rotation, as against 80-100 for Red Spruce. A demand for box boards, for example, will presuppose shorter rotation than for lumber and timber. The factor of expense varies the rotation in proportion to the interest charges on the investment expenses. It is to be remembered that moneys invested in timber production earn no return until the final harvest. While the initial investment may be comparatively small, its value increases greatly due to its increment at compound interest. This period should be fixed at a period when the yield possible in a given time shows the greatest margin of profit over the anticipated compounded expenses.

**The Financial Returns.**

It is assumed that county forests will be coniferous. However, this need not necessarily be so. A good healthy hardwood forest already well developed on the ground, the species of which are well adapted to the soil climate and local market demands, may be taken and managed to a profitable return. Such a forest as this managed on a basis of continuous forest production is capable of producing an annual growth equal to 300 board feet of wood material per acre per year, yielding a net return of between \$3.00 to \$5.00 per acre per year.

On the whole, however, generally speaking on the same site, softwoods (planted white or red pine) will yield a better return than hardwoods. Hence, any forest management will tend to develop the highest possibilities of the site and will hence seek the development of softwood coniferous forest rather than a hardwood forest.

Consequently it seems best to make any estimate of the financial returns to be expected from a public forest under management on this basis.

In the following calculation the interest rate of 5% has arbitrarily been established. It is not too low. In fact is rather high. Inasmuch as Victory Bonds were issued at from 3½ to 4½%, the adoption of this rate seems well justified.



A planted forest will begin to show results in a very short time. This picture shows a planted forest of Scotch Pine and Norway Spruce. The trees were planted in 1908 and 15 years later showed a height growth of from 20 to 25 ft.

**Basis of Calculation.**

Cost of establishing plantation . . . . .	\$15.00 per acre
Additional work in clearing and freeing pine . . . . .	1.00 per acre
Protection and administration, annually . . . . .	0.20 per acre
Rate of interest used . . . . .	5%
Age at which timber should be cut . . . . .	40 years

Yield in Lumber at 40 years—	
White Pine 28,000 per b.f. per acre at \$20.00 per M . . . . .	\$560.00
Red and White Pine, equal mixed, 25,000 b.f. per acre at \$20.00 per M . . . . .	500.00

**Results**

<i>White Pine Plantation</i>	
Value of timber at 40 years.	\$560.00
Expenses accumulated at 5% Compound interest to the 40th year. . . . .	\$150.00
Net profit in excess of all expenses . . . . .	410.00
	\$560.00 \$560.00

Net profit on the investment approximately 8%.

<i>Red and White Pine Plantation</i>	
Value of timber at 40 years. . . . .	\$500.00
Value of compound expenses . . . . .	\$135.00
Net profit . . . . .	365.00

500.00 500.00

Net profit on the investment approximately 7.6%.

In the foregoing calculation two items, usually included in such calculation, have been omitted, namely, the value of the land, and the taxes on the land. This omission is justified by the assumption that such land used for public forest is valuable for no other purposes and has been accepted by the municipality in lieu of taxes, evidence of its lack of value. Inasmuch as it is a public forest, it will not be required to pay taxes.

Where bare land is purchased for purposes of plenty or reforestation, prices from \$5 to \$15 are justified and at such price the investment will yield a net return of from 5 to 6%.

The public forest fundamentally is an economic proposition and as such is capable of yielding a financial return to its owner, the municipality. The benefit of such a forest to the community is without question. Not only is there given a protection of watersheds, of stream flow, of drinking water, not only is there given to the people of the community opportunities for healthful recreation, but these forests can be so managed that there is return annually from the well managed to the treasury of the municipality, definite cash revenue, the amount of which is in direct proportion to the amount of forest under management, which returns can be directly apportioned to the lessening of the tax burden upon the individual citizen or the direct improvement of the community as a whole.

## Bernhard Eduard Fernow---An Appreciation

By Dr. Clifton D. Howe

**M**Y first experience with Dr. Fernow in the forest was a sixteen mile tramp across country on a mid-April day in northern Ontario. We had come direct from the confining work of school and probably none of the party of instructors and students had walked a mile a day during the Winter. The snow was soft, the muskegs were knee-deep with slush and the streams without crossings. Dr. Fernow was close to sixty years old then, but at the end of the day he showed no indication of weariness. On the contrary, he still maintained the buoyancy of body which gave that impression of walking without effort, so characteristic of the man. While the other members of the party were too tired to hold up their heads and could hardly drag one foot after the other, at the logging camp that evening he danced a "break down" and told witty stories to the great entertainment of the assembled bushmen. Such was the spirit of the man! Yet to think of this only as an expression of hardiness and self-control would give the wrong impression. His action was reasoned and, from a physiological and psychological standpoint, the very best thing he could have done. The incident is illustrative of his mind at work. He had a unique capacity of envisaging a situation and comprehending its requirements. His mind, although rapid and apparently spontaneous in action was closely analytical and logical in its processes. There were eminent lawyers in his family and he was originally trained for the law. His writings display the concise statement, the marshalling of evidence, and the attitude of pleading of a mind inherently legal in its attributes. His written works, also, display a rare and highly developed feeling for term quality. There was no looseness of expression; every word he wrote had a precise and exclusive value. This attribute led to the frequent formulation of short expressions that contained a world of philosophy. His associates and students can never forget his oft repeated briefs that comprehend the fundamental principles of forestry, such as: We must protect in order to practice. Save by intelligent use. Forestry is a function of the State.

He enjoyed a controversy as a mental exercise in clarifying ideas. His best expressions were brought forth at such times. He would characterize a situation or the weakness of an opponent's argument with cutting

pungency, but always without malice. There was nothing personal about his controversies; he was simply defending certain forestry principles which he ever held supreme. He had just cause for resentments, but he never held them, and he would defend the men who treated him the most shabbily when their motives were attacked by others.

Dr. Fernow's mind was not only expert in analyzing the present situation, but it, also, had a prophetic quality. He predicted events in the development of the forestry movement in the United States and Canada that were almost uncanny in their precision. For example, forty

years ago amidst howls of derision he foretold the present timber shortage in the eastern United States. He was only a few years short on the time of its coming and that was due to the fact that neither he nor anyone at that time could have foreseen the extent to which Canada would contribute its pulpwood and its pulp and paper products to the States or could have anticipated the extent to which abandoned farm lands in New England and New York State would furnish second growth white pine.

His mistakes, if we may call them such, were those of pre-vision, rather than of judgment. He was right and the majority were wrong. The proof of such a statement time alone can disclose and time has demonstrated it for him abundantly. For example, certain policies and lines of activity in forestry work were discarded by Dr. Fernow's immediate successors in the United States government service, but after some years of experience they were re-instated and are now regarded as fundamental by the profession.

Some of his actual silvicultural work in the forest was for years declared a failure, but in the meantime the trees kept on growing and now they have demonstrated the wisdom of his course. One of his severest critics once said to me, referring to a widely discussed controversy in which Dr. Fernow's judgment was concerned. "He is right in principle, but wrong in policy." Then he added prophetically: "Some day they will raise monuments to Dr. Fernow, especially in the State of New York." That remark was made twenty years ago. It is a source of profound gratification to his friends that the first monument was dedicated while he still lived, in the form of Fernow Hall, at Cornell University. The value of the



Photo by E. H. Finlayson

A Great Forester—Bernhard Eduard Fernow  
Born 1851—Died 1923



testimonial is enhanced by the fact that it was erected in the place where he met the severest disappointment of his professional career.

Dr. Fernow's teaching was stimulating and inspirational. He held up ideals of achievement and disclosed vistas of paths along which the active mind might travel. He was a clear, concise and convincing speaker. His lectures were brightened by humor and adorned by elegant phrase. Both he and Mrs. Fernow had a deep personal interest in the students. Their home was always open to them. They were considered as members of the family and were always spoken of as "our boys." He rarely criticized, but he had a gentle and tactful way of making a student realize his deficiencies. He recognized intuitively the psychological moment and a few quiet words of his have made the turning point in the careers of many of his students. Other foresters sought his advice. In the later years much of his correspondence was of this nature. Thus he kept in close contact with the progress of forestry in all parts of the continent and exerted a profound influence on its development.

He was above all a public educator. The greater portion of his marvelous energy was given to this kind of work and it will be for this that his name will go down to posterity. When he came to America in 1876, the word forestry could not be found in the dictionaries. The eleventh edition of the *Encyclopaedia Britannica*, published in 1910, contains eight pages devoted to forestry in the United States. This measures for the most part the result of his persistent, indefatigable work as a public educator. His articles written for newspapers and magazines number over 600. He prepared or collaborated in the preparation of over 50 government bulletins. He

founded, edited and published, the "Forestry Quarterly" for fourteen years and became the editor-in-chief of the "Journal of Forestry," when it superseded the "Quarterly." He was the author of two standard textbooks in forestry and the author of another book on the care of ornamental trees.

The value and magnitude of Dr. Fernow's work cannot be adequately measured or appreciated at the present time; they will grow with the increasing years. Only a few realize the extent and power of the obstacles he surmounted. Few can realize the discouraging and deadening effect of a stupendous public apathy both in Canada and the United States toward the conservation of natural resources. For years his was a lone voice in a wilderness of ignorance, opportunism and smug complacency. That the tide is beginning to set in the opposite direction is due more than to any other one factor to his facile pen and convincing argument.

Dr. Fernow was one man among tens of thousands; his achievements were great; his personality, however, was his greatest and finest quality; always kindly, always courteous, always tolerant and always unselfish. No matter how hard the toil, no matter what the discouragements, the body and mind and spirit remained buoyant. And these qualities reached their supreme expression in his last illness.

There has passed from us a seer who had many of the characteristics of the major prophets of old, a man who will rank high among the founders of the prosperity of two great countries, an exemplar of an unselfish life wholly devoted to public service and, more important than these a source of inspiration, a counsellor and friend of young men.

### Railways Generous with Educational Aids.

THE Canadian Forestry Association acknowledges the great contribution made to the cause of forest conservation and the extension of tree planting on the southern prairies by the Canadian Pacific Railway Company and the Canadian National Railways. The loan of the Tree Planting Car by the Canadian Pacific and of the Forest Exhibits Car by the Canadian National is in itself a very substantial service to the forestry cause but the haulage of these cars over thousands of miles of the systems represents a gift quite beyond the financial capacity of the Association. By the loyalty of the railway companies, the promotion of timber protection and tree planting through these travelling agencies has been made possible.

### CHANGE OF ADDRESS

The Canadian Forestry Association offices which include the editorial and business offices of "The Illustrated Canadian Forestry Magazine" have been removed from the Jackson Building, Ottawa, to the Standard Bank Building, 51 Sparks St., Ottawa. The growth of Association activities, has necessitated greater office space than was available at the former address. Members and business correspondents are requested to take note of this change.

### Free Book on Maple Sugar Industry

Any of our readers interested in the maple sugar and syrup industry of Canada may have a most interesting book of 48 pages, well illustrated, by writing the Editor of Publications, Department of Agriculture, Ottawa, asking for "The Maple Sugar Industry." The book was prepared by Mr. J. B. Spencer, B.S.A., and is a valuable compendium of up-to-date information. Copies will be sent without any charge to readers of the *Canadian Forestry Magazine*.

### \$2,000 in Cash Prizes

FRANK J. D. BARNJUM, of Annapolis Royal, N.S., and Montreal, who recently awarded \$5,000 in prizes for the best treatise on the most practical methods of preserving Canadian timber from further destruction by the budworm and other insect pests which have recently caused such great losses to our forests, is now offering \$2,000.00 in prizes for the most convincing argument in favor of prohibiting the export of unmanufactured wood from Canada. One thousand dollars of this will be paid for the best argument written in the English language and \$1,000.00 for the best in French, in the following manner:—Five hundred dollars to the winner of the first prize in each language; \$250.00 to the second; \$150.00 to the third, and \$100.00 to the fourth. The competition is open to all residents of Canada. The essays must not exceed 600 words in length. The competition will close on March 15th and no entry will be eligible bearing postmark later than that date. Entries should be addressed to Frank J. D. Barnjum, New Birks Bldg., Montreal, Que.

# E D I T O R I A L

**ILLUSTRATED CANADIAN FORESTRY MAGAZINE**

*Published and Owned by*

**The Canadian Forestry Association  
Standard Bank Bldg., Ottawa, Canada**

ROBSON BLACK . . . . . Editor  
GEORGE A. MACKIE . . . . . Publication Manager

SUBSCRIPTION RATES	
With Membership in Canadian Forestry Association	
Association . . . . .	\$2.00 a year
Contributing Membership . . . . .	\$5.00 a year
Life Membership . . . . .	\$25.00
SINGLE COPIES, 20 CENTS.	

## Owned by Your Great-Grandson

**T**HERE are many questions to be asked and answered before a proper alliance develops between the wood-using industries and the government controllers of the licensed timber lands, but no one can say that Forest Conservation is solved until both parties reach a working agreement competent to safeguard the rights of our Canadian population one hundred years hence. The kernel of the conservation problem is not to be found in the Doyle Rule versus the Quebec Rule or any other such incidental but in the making of immediate preparation to maintain the nation's forest wealth unimpaired.

One fact cannot be laid aside: the great grandsons of Canadians who read these lines have a majority share in the public-owned forest resources as they exist in 1923. Cobalt and Porcupine are non-reproducible assets. We mine them and it is quite proper that we should do so. But the Forest is a reproducible asset and because it is so, the principles of the metal miner must not apply. A Forest that grows on state-owned land is a Trust Fund. The moment the Canadian people develop a sense of "future rights" in the nation's forest resources, a great step will have been taken to put forest management on a sound basis.

## One Way to Serve Canada

The Canadian Forestry Association has no identity or power of usefulness except what its members give to it. All that is asked of the individual member at this season is that he promptly pay his annual fee of two dollars. Few of our good friends suspect that the repeating of a single account takes eleven cents away from funds badly needed for educational work. Get out your membership bill today and tack on your cheque. The minute it takes you to do that will result in added hours of constructive work by the Canadian Forestry Association.

The Canadian Forestry Association is an educational league of 12,000 Canadian citizens, four thousand of whom live in the prairie provinces. The members are not an appendage, but constitute the body and brain through which the Association does its educational work. Each member is also a subscriber to the Illustrated Canadian Forestry Magazine, but more important than that he is a personal shareholder and exerts a personal control over the widespread educational enterprises in forest fire prevention and tree planting, from which Canada derives a mighty benefit.

The Association has no administrative relation to the work of fire ranging or tree distribution or tree planting, which are the duties of Governments or limit-holders organizations. The Canadian Forestry Association is solely educative. Its work is spade work. Its duty is not to "fight" forest fires but to prevent such fires from ever being started. Its zone of action is not planting a few thousand trees but in persuading a few thousand men each year to plant a few million trees.

The Association is a chain of 12,000 links. Its work is wholly for the good of Canada. It is citizen's work. It cannot be shoved off on the back of "Let-the-government-do-it."

## Efforts Commended

**T**HE Manitoba Horticultural and Forestry Association, an important and useful educational body, held their Annual Convention at Winnipeg on January 30-31 and February 1st. The following resolution was passed:—

"Resolved, that this Association commend the efforts put forth by the Canadian Forestry Association in keeping before the Federal Government and the public in general, the importance of preserving our valuable forests and of the reforestation of land suited for tree culture only. We heartily recommend the "Canadian Forestry Magazine", as a source of most valuable information about forests and their preservation. We humbly request through the Forestry Association, the Federal Government to take a deeper interest in preserving and improving this important natural resource."

## A NOTIFICATION

Members of the Canadian Forestry Association are hereby notified that Mr. D. Algar Bailey who was temporarily employed in connection with the Young Canadians Forest League, the junior branch of the Canadian Forestry Association, is no longer connected with the Canadian Forestry Association or any of its enterprises.

# Canadian Forestry Association



OTTAWA

CANADA

## TO OUR MEMBERS:

We sincerely hope you regarded your 1922 membership in the Canadian Forestry Association as well worth while.

It cannot be emphasized too often that the Association is nothing more nor less than organized Canadian citizenship. Our strength is derived from your loyalty to our national objects. Because you stood shoulder to shoulder with our campaigns in 1922 we succeeded in carrying through our total programme.

Because we believe you will be whole-heartedly with us in 1923 we are launching forth on more ambitious projects to help block the plague of forest devastation in this Dominion and, secondly, to help thousands of prairie farmers to establish belts of trees as an aid to agricultural prosperity and the improving of home conditions.

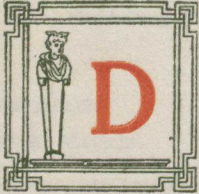
The Association is helpless to act, however, unless the membership fees are paid promptly. Will you therefore fill in the cheque form sent you by our Treasurer and make your membership an active force in the service of Canada?

Yours faithfully,

The Canadian Forestry Association

# The Canadian Forestry Association

## Completes a Year of Service to Canada



**D**URING a twelve-month when voluntary organizations all over America have been reporting deficits and slumps" says the

Montreal Star, "it is somewhat of a relief to read in the report of the Canadian Forestry Association for 1922 an unbroken record of strong advances, increased revenues from voluntary sources and enlargements of all forms of educational propaganda in prevention of forest fires and the advancement of tree planting."

The Canadian Forestry Association is not connected with any government or commercial interest although backed financially by 150 agricultural, mercantile and wood-using industries and by most of the governments.

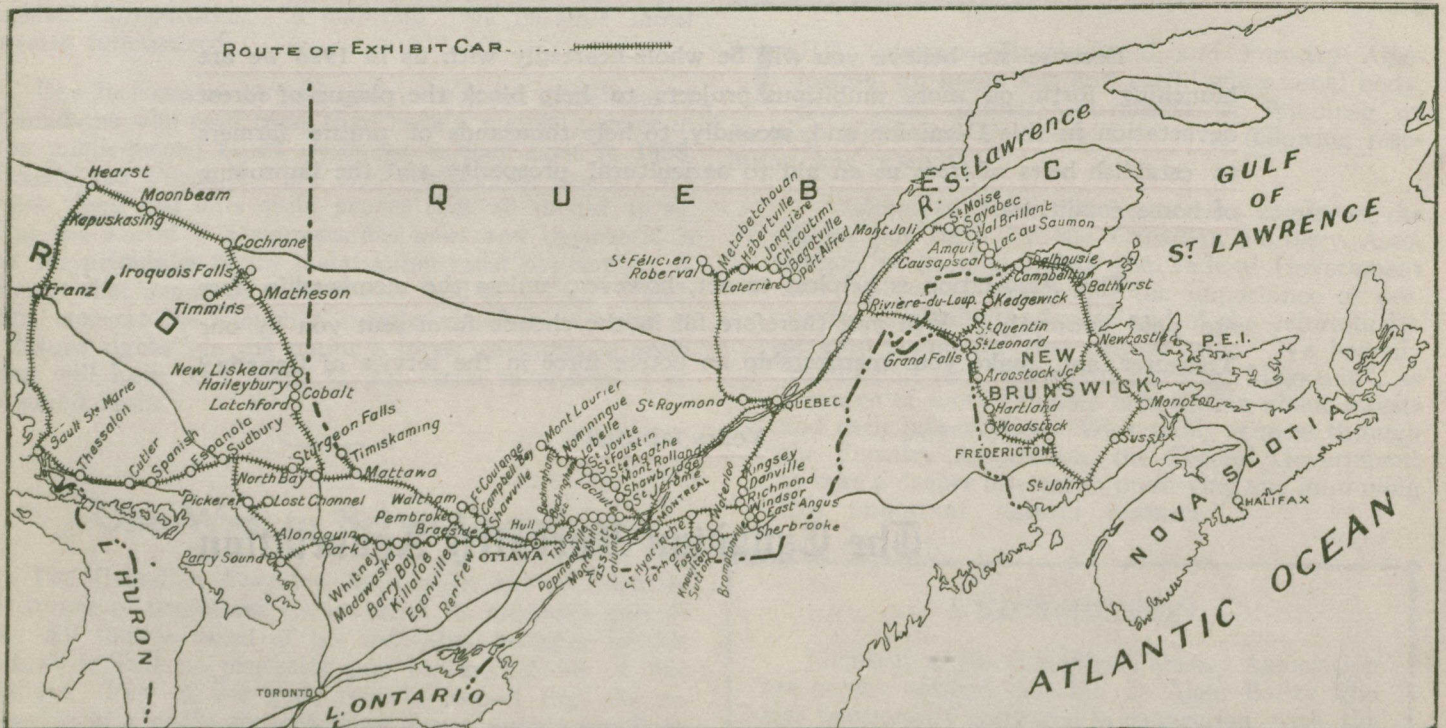
### E. W. BEATTY

PRESIDENT CANADIAN PACIFIC RAILWAY CO.:

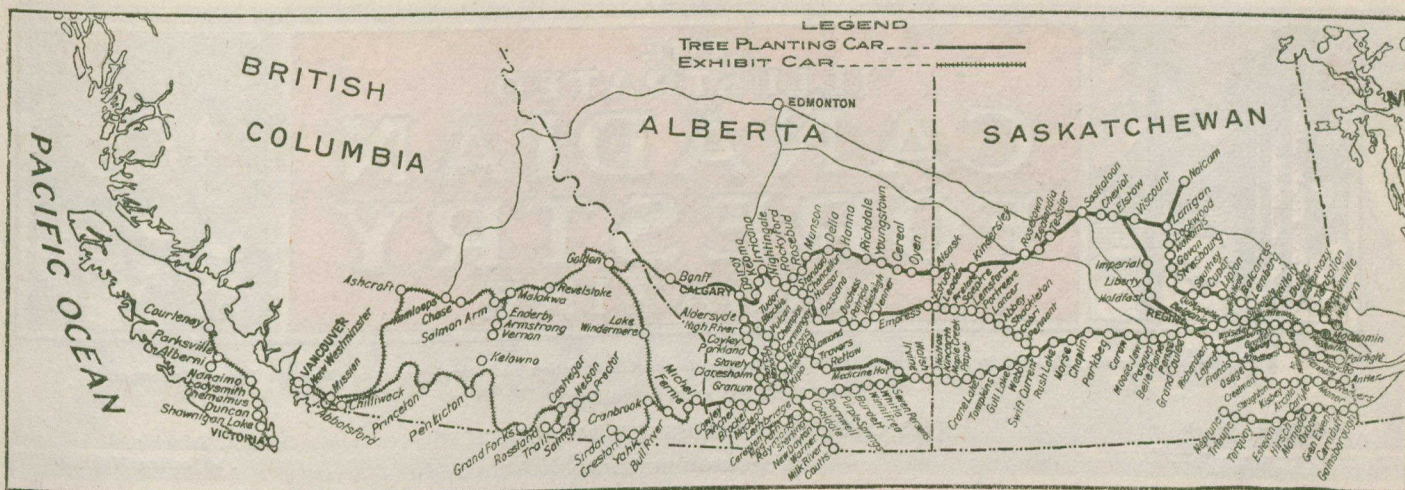
*"It is a matter of great gratification to all of us that the work of your Association is being carried on with such conspicuous success and I heartily congratulate you and your associates".*

The Association's policies are governed by a board of 56 directors including newspaper editors, bankers, forest engineers, lumbermen, paper company pres-

idents and other related interests.



Map showing route followed by Canadian Forestry Association's Exhibits Car during 1922 tour of Ontario, Quebec and New Brunswick,



Map showing route followed by Canadian Forestry Association's Tree Planting Car during 1922 tour of Saskatchewan and Alberta and Route followed by Exhibits Car in British Columbia.

**T**HAT forest protection in Canada is an imperative national need is perhaps better recognized than the companion fact that forest protection is chiefly a question of public sentiment. The weakness in public forest policies can be traced directly to weak public opinion. The Canadian Forestry Association's chief business is to make the Canadian citizen an active and enthusiastic partner in the protection and proper handling of his country's forest resources. There is a parallel enterprise to which the Association devotes much effort, that of encouraging farmers in the southern prairie districts to establish shelter belts about their homes and farms. This may seem a sentimental proposition until one realizes that crop protection, the prevention of soil drift, the conservation of moisture, and last but not least the improvement of human environment on the prairies cannot be effected without wholesale planting of trees.

Some newsy facts from the Association record of public service in 1922 are presented in the following digest:

Our Publicity Bureau secured 100 to 150 columns a week in 400 Canadian newspapers. This space was devoted to forest protection, cer-

tain phases of public forestry policies and to tree planting on the prairies.

Five special writers are used by the Association to prepare newspaper material.

Five hundred and eighty-four public meetings were held by Canadian Forestry Association lecturers, with a total attendance of over 20,000 persons.

The Forest Exhibits Car travelled 12,625 miles, covering the smaller communities of maximum forest fire hazard, and secured an attendance of 219,000.

The Tree Planting Car, working on the southern prairies, travelled approximately 8,000 miles and in the small farming communities drew 51,975 persons.

The Young Canadians' Forest League was instituted with a working alliance with 120,000 boys.

The income of the Association increased by 24 per cent., or \$11,483 to \$59,320.

**T**HE foregoing statistical facts do not touch more than the fringe of the Canadian Forestry Association's activities. A total of twenty educational campaigns are constantly in action reaching, it is estimated, **over 300,000 people a day.**

Government grants advanced from \$15,050 to \$17,150. Special subscriptions from private firms and individuals increased by 32 per cent., or from \$14,188 to \$18,782.



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

PUBLISHED AND OWNED BY

Robson Black,  
*Editor*

THE CANADIAN FORESTRY ASSOCIATION

Geo. A. Mackie,  
*Publication Manager*

225 JACKSON BUILDING

OTTAWA

**AN OPEN LETTER TO COMPANIES OR INDIVIDUALS**  
**SEEKING A NATIONAL MARKET IN CANADA**

GENTLEMEN:—

Are you aware that it would cost you at least \$400 *in postage alone* to present your merchandising appeal to the 13,523 Canadian families who each month receive this publication? It will cost you about one-eighth this amount to reach this same audience in full page space through the advertising pages of our magazine.

This is not taking into account the gross numbers of those same families who, as readers of the magazine, are also potential buyers of your products.

We have recently conducted an analysis of our circulation and propose to set forth the results obtained in a series of printed announcements.

Fact No. 1, which we submit for your information, is:—

*Of our 13,523 Subscribers who are distributed throughout 1601 cities, towns and rural districts of Canada, 6,900 own their homes, valued at \$82,800,000; 3,026 of these are farm properties, approximating in value \$32,940,000.*

*Surely this is an audience well worth while addressing.*

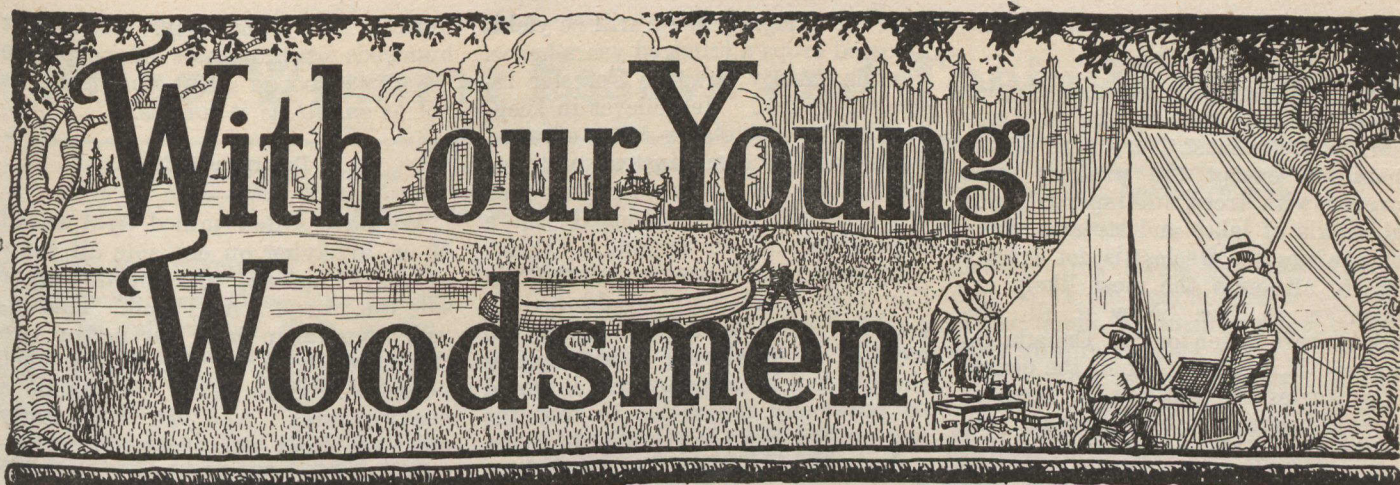
We will welcome an opportunity of discussing with you further the extent of the service we can render you, also the cost and potential profit to you.

Awaiting your inquiry,

Yours very truly,

*George A. Mackie*

*Publication Manager*



## Little Journeys to Timber Land

By Robson Black, Manager, the Canadian Forestry Association

WHEN JOHN MUIR, the famous Naturalist, was strolling one day through a California park, he saw a group of axemen chopping down a mammoth Cedar tree. To learn the age of the monster Mr. Muir counted the rings. It was a painstaking task but when he arrived at the outer edge he had established the tree's age as four thousand years. In the same grove stood many members of the Sequoia family that had weathered from two to three thousand years of history.

It taxes our imagination to think that in our own day we could gaze upon a living thing that has breathed the same air as the Pharaohs. Yet that very fact is a happy illustration how this old world never outgrows its need for trees and forests. We have thousands of Canadian trees that are mere children today and will probably witness the unimaginable events of two centuries hence. Similarly, we have many a Canadian tree that could unfold strange tales of Indian warfare even when Champlain was planning new defences for Quebec.

In the office of any great Trust Company, you may see tiers of steel boxes. Each contains the story of an estate, placed in the hands of the company for careful management. The heirs of each estate are looking to the company to safeguard and improve each piece of property — whether a farm or a row of houses or the cattle on a ranch, or a mine — with such close attention that the estate will return a profit year after year and if possible, the profit must never grow smaller.

We Canadians, children or grown-ups, are a good deal like that trust

company. We have been given by our forefathers a splendid country, not as spending money but as a sacred trust, a savings account. That is the way the people in France and Switzerland and Sweden look at it. France has forests probably four times as rich as they were a hundred years ago. They do not burn down their forests in Europe as we do, but prefer to keep them green and thriving in order to provide employment and keep everybody prosperous. There are towns in France and Switzerland that pay all their taxes out of the profits of pieces of forest much smaller than those we burn up year by year in nearly every province of Canada.

Some of you may have seen a mammoth bridge that conveys the commerce of millions of workers and hundreds of factories high above a rushing river. And you have marvelled at the four or five huge pillars, anchored to bed rock by masses of cement and steel, bearing up with ease the great superstructure of metal and resisting every strain.

Well, we Canadians owe everything to five great pillars upon which our nation is built. I refer to the agricultural lands, the forests, the mines, the fisheries and the water powers. In this article we are talking chiefly of the forests. There is a very special reason why we should select the forests. We may misuse and waste the fisheries and the mines and the lands and water powers, but certainly they cannot be burned down. But with forests, a thousand square miles may be turned to charcoal in a few days and all that looked so useful and so

beautiful transformed to an ugly smoking ruin. That is why so much is heard of forest protection these days, because of all the bountiful gifts we Canadians have inherited, the forests are the most easily and quickly destructible.

### About Forest Fires.

I want to tell you about some forest fires that have occurred in Canada. The worst as regards loss of life was the 1916 disaster in Northern Ontario when 223 persons lost their lives and 800,000 acres were swept bare within about three days. In 1911 the Porcupine fire destroyed 84 persons. The Minnesota disaster of 1918 brought death to nearly one thousand men, women and children. Perhaps the worst of all forest fires was the Peshtigo holocaust of 1871 in Wisconsin when 1,500 lives were sacrificed and flames devoured everything on 1,280,000 acres. The famous Miramichi fire of New Brunswick occurred in 1825 when the population was comparatively sparse. Commencing with a small blaze that any boy could have extinguished, the great conflagration swept in nine hours across 3,000,000 acres and demanded the lives of 160 people.

How big do you suppose the forests of Canada are? An acre field is quite a large playground, isn't it. You would do well to kick a football across an acre width.

Well, Canada has 500 million acres of forest lands, but of course only about half that is covered with really good-sized trees. Russia has the greatest forests in the world, then comes the United States with three

or four times as much timber as Canada.

In the days when Jacques Cartier sailed his little ship up the St. Lawrence route, almost every acre of the Dominion except the prairies was covered with trees, interspersed with thousands of lakes and streams. Why the prairies are treeless is not exactly known, although the most likely explanation is Fire. Now if all the people were taken out of Canada tomorrow, it is likely that in the course of centuries the millions of acres of bare farms in Eastern Canada and British Columbia would all be matted over by tree growth once more. We want no such thing to happen. We ought to take away from the trees every acre that will grow farm crops, because the world needs food. Moreover, farm crops come every year while forest crops come only in half a century or more. On good farming land, a man could make far more money from wheat or oats than from growing trees. But this brings us to a very interesting question: how much of Canada is made for growing forests and how much for growing farms? In Ungava and in the great stretches west of Hudson's Bay up to the Arctic Circle, there may never be any considerable population. But excluding those vast regions of Canada, how many acres in what remains were made by Mother Nature for growing farm crops and how many for growing forests? Eight acres out of every ten are unfit for farming and were intended either for growing useful crops of timber, which all of us need day by day, or to remain as barren stretches of rock and soggy marshes. Of course you and I know plenty of places where nearly every acre within sight is splendid for farming, but we are speaking now of Canada as a whole.

#### Definition of Forestry.

That brings us to a definition of Forestry. You know the word Agriculture which means making the most profitable use out of the soil. Forestry is best understood when we use another name—Silviculture. Like Agriculture, Silviculture also tries to make the best use out of the soil, but it asks not one acre that the farmer needs, being willing to take only the lighter and poorer lands. The man who works the Canadian farm and the man who develops the Canadian forest therefore are business partners. When one prospers, the other cannot help but gain.

I do not need to tell you that a

good farm, rightly used, will be yielding good crops a hundred years hence. That is exactly how the Forester regards a Forest. He believes in keeping the forest yielding crops of wood for all time to come, instead of treating it as a silver mine to be gouged out once and then abandoned as a useless hole in the ground. Somebody said once that without the Tin Can New York City would be impossible. He meant that unless a method of preserving food supplies cheaply had been discovered, it would be physically impossible to feed the five million New Yorkers three times a day with fresh food delivered from farms.

#### Owes Life to Forests.

It is even truer that our Modern Canada owes its life to the possession of splendid forests. Our railways must have a wooden tie or sleeper for every yard of track. Just one of the telegraph companies in this country requires 50,000 telegraph poles each year to replace those put out of service. Not a ton of coal would be raised from any coal mine unless train loads of wooden props had first been put in position. No fisherman would earn a livelihood without a wooden boat and boxes and barrels. No farmer would cultivate his land until he first was assured of a wooden house, barns, fence posts, wagons, implements, and fuel. How many of us would care to reside in a house without wooden furniture, wooden floors, or musical instruments. Truly the uses of wood in our daily lives are almost beyond accounting. We must not forget, however, the daily and weekly newspaper which is very largely a product of ground-up wood. How necessary the newspaper has become in all our homes! And yet it is just one more of the great gifts derived from the Canadian forest. How many newspapers do you suppose are printed every day in the United States and Canada? Forty millions. In the course of a year, the hunger of the newspaper press demands a pile of wood four feet long, four feet high and nine thousand miles long. You would have to build that woodpile right across Canada from Halifax to Vancouver, then back to Halifax and make a return trip to Vancouver.

Of course, we are interested in all these facts about the forest for one chief reason. We want to make the forests of Canada do us the greatest service. We want them to build up hundreds of new towns to make the paper and the lumber and the fur-

niture. We want them to attract hundreds of thousands of people to Canada's shores. But the thing is not as simple as it sounds.

#### A Determined Fight.

We have a determined fight ahead of us, involving on one side all courageous Canadians and on the other side the Forest Fire Fiend. This invader has taken from our nation two thirds of the great forests we once possessed. Each year, it demands a heavy ransom. And yet, it is mostly our own fault that such an unwelcome visitor should dwell in this country any longer. The forest fire fiend is burning down enormous forests, he is destroying precious lives, he is turning hundreds of homes to ashes every Spring, Summer and Fall. We are trying to build up a League of the Children of Canada to overthrow this useless monster and I am sure the co-operation of every boy and girl is already assured.

How can it be done?

Nearly all forest fires start with a pair of careless human hands.

If we could have every Canadian watching his finger tips and thinking what damage they can do and what prevent while in the forest, there would be very few disastrous fires.

Let us finish our subject for this time, however, by asking and answering one simple question:

"What can I do to preserve the forests of Canada?"

The best man to answer that is a veteran hunter and guide. He has seen more fires start than any of us and knows the causes exactly:

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

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

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

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

Finally, be sure to put the fire out before you leave the camp. Cover the embers with earth or water.

But if you catch sight of a fire started from any cause, notify the nearest ranger, or station agent or any public official."



# Prize-Winning Essays and Their Writers

In this and subsequent issues of "The Illustrated Canadian Forestry Magazine" there will be published prize-winning essays in the recent School Essay Competition, conducted by the Canadian Forestry Association. The prizes awarded for each Province were as follows:—1st prize \$25; 2nd prize \$15; 3rd prize \$10.

**O**UR FORESTS are something in which all Canadians should be interested, since in the future of the forest lies a great deal of the future wealth and prosperity of the Dominion.

One might think that there is little need to worry since the forests seem so inexhaustible, but this is not so. There is ever going on, a course of devastation and destruction appalling in its immensity, which if allowed to continue unprevented, would in a short time, destroy all our vast acres of forest, and cut us off from one of our greatest sources of wealth and industry.

Along with Spring comes that smell of smoke in the air, which tells us that a forest fire is under way. Of all the causes of forest fires, such as live cinders from trains, bush fires beyond control, and carelessness, the latter is the most common. Just a match or cigarette dropped in a bunch of leaves, a puff of wind, and angry flames like hungry tongues leap up to devour perhaps an entire forest. When we think of the years required by these trees to complete their growth, and of the short time in which they may be destroyed, the work of years thus being undone in so many hours, the graveness of the situation impresses itself upon our minds.

## 1st Prize—New Brunswick

By Adelaide F. MacLauchlan  
Perth Jct., N. B.

### OUR FORESTS



Miss Adelaide MacLauchlan

Each time a forested area is burned over, less and less valuable trees grow up in place of the original forest. In almost every case the seed trees are killed, and consequently the area must be reforested. Besides being valuable for the timber it contains, a

forested area forms the best watershed, so we see that in preserving our timber lands, we insure an abundant water supply as well.

Many steps have been taken in the last few years towards preventing forest destruction. Forestry exhibition cars, lectures and moving pictures, have been sent from place to place to show the people the value of the forests, and the necessity of protecting them. There are also a great many other ways that have been taken to aid in stemming the tide of destruction. Thus we see that our forests require constant and vigilant care, if we are to keep them increasing, instead of decreasing and anything worth having, is well worth the effort it takes to get it. Our forests repay us a hundred-fold for the care we exercise over them.

A great deal of the timber lands of Canada are under Government control, but when we consider the fact that four-fifths of the Dominion are suited to the growth of trees only, we see the necessity of the Government taking the lead. This is no reason for the care of the forests being left entirely to the Government, however, for it is the duty of every individual as a tree patriot, to his or her country, to do all in their power to aid in preserving and protecting our forests.

## Premier Prix—Quebec

Par Germaine Virolle, (15 ans)  
Montréal, Que.



Mlle Germaine Virolle

Un certain amiral anglais passait tous ses loisirs à planter des arbres. Il en plantait partout, dans ses terres, le long des routes, ou sur la pente des collines rocailleuses, impropres à la culture. Ses amis le disaient toqué. Il leur répondait un jour: "Je plante des arbres pour rendre service à la marine et être utile à mon pays. On sait qu'il faut au moins 10,000 arbres pour construire un vaisseau; or, 10,000 arbres, c'est déjà une petite forêt. S'il n'y avait pas d'arbres, il n'y aurait pas de flottes!"

S'il n'y avait pas d'arbres, non seulement il n'y aurait pas de flottes, mais tout le pays souffrirait.

Le long des rues de la ville et dans les parcs publics, il est indispensable d'avoir des arbres qui purifient l'air, en absorbant l'acide carbonique. Ensuite les arbres sont une protection à mis l'instruction et la littérature à la portée de tous.

contre les vents et le soleil ardent; leur ombrage donne de la fraîcheur. Comme on les apprécie quand le pavé est brûlant! Cela dit, sans parler de leur côté pittoresque. Quel serait l'aspect d'une ville dépourvue d'arbres? Il faut donc planter et entretenir des arbres dans la ville pour l'hygiène comme pour l'esthétique.

Les Canadiens devraient apprécier leurs splendides forêts, parce que l'industrie forestière rapporte au pays plus que n'importe quelle autre industrie, sauf l'agriculture. Elle nous fournit le bois si indispensable. Sans le bois, pas de construction, pas d'ébénisterie, pas de carrosserie!

C'est encore à la forêt que nous devons la pulpe à papier, qui a donné à l'imprimerie un si grand essor et a mis l'instruction et la littérature à la portée de tous.

Un bon patriote doit faire tout en son pouvoir pour empêcher la des-

truction des forêts par le feu parce que les forêts entrent comme cause première dans la fertilité et la prospérité du pays. Elles préservent de l'inondation, de la sécheresse. Une contrée bien boisée a un climat sain, des champs fertiles, des cours d'eau suffisants. La conservation des forêts est donc le grand secret de l'avenir de notre pays. Mais si le feu continue chez nous son œuvre destructrice, le Canada, si réputé pour

ses "immenses grands bois," pourrait bien voir son étoile pâlir et sa prospérité diminuer.

Il s'agit ici, non de théorie, mais de pratique. L'important est d'agir. Comment? Par notre prudence d'abord. Que les touristes aient soin d'éteindre le feu de leur campement! Que les fumeurs prennent soin d'éteindre leurs bouts de cigares et la cendre de tabac que négligemment ils jettent à la lisière du bois! Que les

fermiers soient prudents et qu'ils surveillent les feux de nettoyage allumés dans leurs champs; et que les défricheurs qui font de l'abatis observent bien toutes les recommandations qu'on leur prodigue! Protégeons nos forêts et faisons comme notre amiral, plantons des arbres.

A l'œuvre maintenant, et que chacun dans sa sphère d'action apporte sa part de travail pour le bien commun.

La Providence a beaucoup ajouté à la richesse et à la beauté de notre cher pays en y faisant croître de vastes forêts. Aussi, des hommes de sage prévoyance, soucieux de la prospérité du Canada, emploient tous leurs efforts à seconder l'œuvre divine, et cela en protégeant les arbres.

Après le sol, les forêts sont de première importance dans notre pays; aussi la plantation d'arbres dans les prairies de l'Ouest devient-elle un sujet de véritable intérêt pour les Canadiens.

Les arbres se divisent en trois catégories: les arbres fruitiers, forestiers et d'ornement. Sources fécondes d'ombrage et de richesse pour la ville, les arbres d'ornement sont cultivés en grande quantité dans les parcs et le long des avenues. Cette culture est des plus importantes en ce qu'elle contribue à la salubrité de l'air, à la diversité des parures, à la destruction des insectes et à la gaieté de la nature. Le frêne, l'orme et l'érable sont tout spécialement employés à ces effets.

Sans arbres, quelle tristesse planerait sur toute la ville! Le parc n'aurait plus les charmes que lui donnent ces longues allées boisées où il fait si bon se promener ou se reposer à l'abri des ardeurs du soleil! Les avenues, dépourvues d'ombrage, perdraient une partie de leur ornementation et de leur agrément! Les arbres sont de grande utilité pour les oiseaux qui bâtissent leurs nids sur les branches; en retour, ces bienfaisants destructeurs d'insectes protègent la végétation, et en qualité d'agréables chantres de la nature, égaiant les parcs et les avenues. L'absence d'arbres nous ravirait donc la jouissance que procure la mélodie de l'oiseau!

Dans cette ville, des soins minutieux sont prodigués à la culture et à la conservation des frênes, ormes, érables, chênes, bouleaux et sapins.

De tous ces arbres, l'orme est celui qui donne le plus d'ombrage; aussi

## Premier Prix—Manitoba

(Français)

Par Annette Dumouchel  
Académie St. Joseph, Saint-Boniface, Man.

### NOS ARBRES



Mlle Annette Dumouchel

ne peut-il être surpassé comme arbre d'avenue, en raison de sa rapide croissance et de la faculté qu'il a de se garantir des brûlures du soleil. Le bois de l'orme est fibreux, solide, et résistant bien à l'humidité; il est utilisé dans les constructions. Ses feuilles sont alternes, simples et dentées; ses fleurs polygames sont groupées en fascicules.

Quoique d'immenses étendues de territoire canadien soient plantées d'arbres forestiers, notre pays souffre considérablement d'une lacune qui se fait sentir dans tout le Canada. Cette lacune, je veux dire d'arbres, est attribuée aux feux de forêts qui, maintenant plus que jamais, causent de pénibles ravages dans notre contrée.

Ils font preuve d'une négligence coupable ceux qui, chargés de prendre soin des forêts, demeurent indifférents lorsqu'il s'agit de s'acquitter de leurs fonctions; aussi se rendent-ils responsables des incendies qui occasionnent tant de ruines et privent le Canada de richesses immenses.

Pour remédier à ces tristes abus, tout vrai patriote devrait faire usage des moyens que la prudence met à notre portée afin de préserver nos forêts contre les atteintes du feu. En conservant nos arbres, soyons assurés que nous contribuons largement à la renommée et à la prospérité du Canada, puisque la place qu'il occupe parmi les contrées du monde, vient de ce qu'il possède les plus grandes ressources forestières après la Russie et les Etats-Unis. Par conséquent, protéger les arbres signifie maintenir, accroître la gloire du Canada!

Tout bon Canadien devrait apprécier et faire aimer les belles forêts puisqu'elles sont un élément de richesse pour son pays. En effet, les arbres forestiers fournissent le bois de commerce, de construction, de chauffage, etc. A peu près les quatre neuvièmes du bois canadien sont employés dans les constructions de tous genres, la seconde partie étant destinée à la fabrication de pulpe. Presque la moitié de ce bois est exporté, l'autre portion est réservée à l'usage des Canadiens. L'érable de la province de Québec est renommé pour sa sève qui produit le "sirop d'érable," utilisé et transporté en abondance dans les pays étrangers. L'industrie forestière emploie un grand nombre d'ouvriers qui, tout en se procurant les moyens de subsistance, rendent service à leur patrie.

Aimons donc nos beaux arbres! Mettons tous nos efforts à la réalisation d'un désir bien cher au patriote, à savoir la protection et l'accroissement de la culture d'arbres au Canada.

In the following paragraphs I will try to describe what forestry is and how necessary it is for the present and for the future.

Forestry is the name given to a scientific system of handling woodlands. The work of the forestry service includes the preservation of woodlands, the reforestation of areas which have been cut over; the planting of regions which have been treeless; the setting aside of forest reserves, the prevention of fires, and the reformation of wasteful methods of lumbering.

The value of the forest is very great. In Canada, lumbering is second in importance only to agriculture. Everyone recognizes the beauty and charm of the forest and we all realize the protection and shelter which the trees give to birds, to flowers and to animals. One of the most important uses of the forest is in preventing rapid evaporation. In open country the water is carried off by the streams as soon as it falls but where forests are present the water is held by the thick bed of moss and leaves and is let go gradually. When the forests are cut the water flows off quickly and great floods are the result. Forests prevent streams from flowing too quickly and thus wearing away the land. In some countries millions of acres of land have been destroyed by rushing rivers. Trees are a protection against wind, and the wood is used as fuel. Forests give rise to many industries.

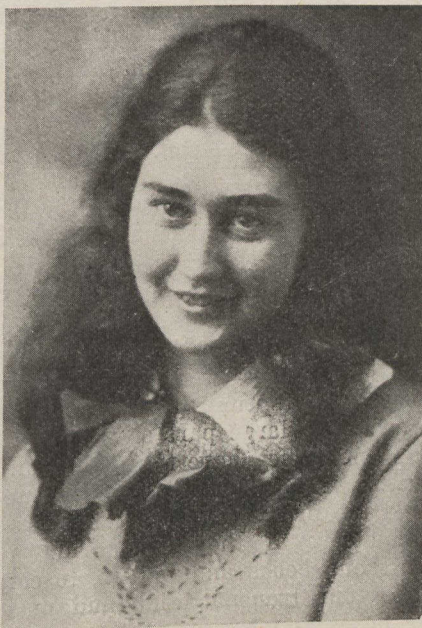
The industries resulting from the forests give employment to many. Among these are the cutting of the trees, the making of dressed lumber and of paper, the manufacturing of matches, boxes and furniture, and the building of houses. All of these help to fill the pay envelopes of many so our forests should be regarded as a great gift.

## Second Prize—Ontario

By Helen Kelly

Convent of Mary Immaculate,  
Pembroke, Ont.

### FORESTRY



Miss Helen Kelly

- (1) Introduction.
- (2) What it is and the work of the Service.
- (3) Value of the forests.
- (4) Industries resulting from the forest.
- (5) Forest fires.
- (6) Prevention of forest fires.
- (7) Conclusion.

Every year large forests are destroyed by fires which are often caused by campers leaving their camp fires burning and by careless smokers throwing away lighted matches. Settlers, clearing their land, are often the cause of forest fires when they carelessly set fire to the brush they have cleared off the land. The earliest settlers burned much valuable timber simply to get rid of it. These fires not only destroy the forests, but often destroy towns and villages, resulting in a loss of life. When the trees are burned there is no protection from the wind and instead of beautiful trees we see large areas of burned logs and stumps. There is also no home for the birds and consequently the crops suffer from the insect pests. Forest fires help to destroy the industries at which so many are employed at the present time, and if it were not for the work of the forestry service the supply of timber would soon become limited and there would be scarcely any for use in the future.

In order to prevent forest fires the forestry service has placed fire rangers throughout the country. These men patrol the huge forest districts, and by reporting and fighting the fires considerable timber is saved. Notices have been placed throughout the forests warning people about leaving fires burning. In the prevention of fire the forestry service has done remarkable work.

Our forests being so useful in providing necessities and comforts, it should be the aim of every citizen to do his utmost to conserve this wonderful wealth of our country and every boy and girl should endeavor to become a Junior Forest Guard, pledged to do his or her utmost to prevent forest fires from starting.

## ODD PIECES FROM CHILD ESSAYS

A FURTHER instalment of "sentence sermons" gleaned from the several hundreds of School Child Essays, received in the Canadian Forestry Association's recent competition, reference to which was made in the last issue of this publication, are here with reproduced. As already stated such publication is not intended to hold up to ridicule their youthful authors but merely to show the very original views re forest conservation which are held by the rising generation.

"Paper mills are eating up the woods like ogres."

\*\*\*

"Let us have severe laws and a force of trained detectives to stop carelessness."

"Without trees people would get seriously ill of brain trouble and die."

\*\*\*

"If it were not for paper made from trees the great men of our country would never get their education".

\*\*\*

"Some birds is used for meats and others is birds of pray which cheer up the woods with their songs."

\*\*\*

"The reason why Canadians value their splendid forest is because they have to trim the trees and keep it respectful."

\*\*\*

"In many homes they are depending on wood for their winter fuel but when the coal dealers have the coal it is so hard to sell it on account of the money."

# Research as Aid to Forest Production

Various Scientific Silvicultural Methods Result in Improved Conditions

*By Prof. J. W. Toumey, lately Dean of Yale Forest School*

**R**ESearch is the foundation upon which modern production rests in every field of human endeavor. Without this foundation, production is insecure, uncertain and buffeted by every economic storm.

The great steel and electrical industries have well equipped research laboratories. Today hundreds of lesser industries are basing their production on research methods worked out in their own laboratories. Industrial development and production in North America owe their marvelous progress to painstaking research in hundreds of laboratories and shops maintained by private agencies and by nations, by states and by educational institutions.

We are in the age of research and on the whole no money has been more wisely spent than that which has been expended in reducing illness, in extending the span of productive life, in making two articles of human need with the same expenditure of man power formerly required for one and in making two trees grow with less human effort when but one grew before.

Research forces us to break away from old methods and accept better ones and predict the results of these newer methods before they are undertaken.

The manufacturer who follows the old "rule of thumb" practices is left behind. The farmer who shuts his eyes to modern methods determined by research finds his crops destroyed by insect and fungus pests and his soil on the way to certain depletion. The forest land owner who fells his stands without following a definite procedure which is certain to attain forest renewal and which is based on investigation and research finds forest devastation the fruits of his practice.

## Production is Rooted in the Soil.

The wonderful productivity of America in all its diverse directions is rooted in the soil. We point with satisfaction to our great steel, coal, oil, electrical, paper, and other industries. We see the industries, but

we forget the sources of our raw products. We are likely to forget our millions of acres of ripening grain, our vast herds of stock and our great stretches of forest. We forget that the lumber and paper industries have their roots in the soil. We forget that the steel, coal, oil, and electrical industries depend on the soil for the food, clothing and shelter for their workers.

We have in our keeping the greatest stretches of fertile land in the world. Our farmers have taken this land, touched it with industry and from it has sprung grain and meat to supply a large part of the world. Our lumbermen have taken this land and from the standing timber supplied the products to build the cities and homes of the new world, to print our books and papers, to construct our transportation and make the boxes and barrels that carry the products from millions of farmers and manufacturers to more than 150 million consumers at home and abroad.

When we came to America, we found here nature's products in wonderful diversity and in great abundance. We found a virgin, uncropped soil, rich beyond the dreams of old world agriculture. We found a forest almost limitless in extent filled with the accumulated growth of ages. The farmer reaped from the soil without a thought of its exhaustion, relying on its accumulated fertility. The lumberman felled and burned the virgin timber, that was centuries in growing, without thought of its ultimate exhaustion.

The farmer is already finding that agricultural research lies at the very foundation of the maintenance of soil fertility and crop production. This appreciation on the part of the farmers both in the United States and in Canada is forcing the employment of literally thousands of men trained in agricultural research. Through national, state and county agencies; through both public and private research stations, the foundations for enduring agriculture are already in place. Much of our land is only useful for the production of timber. It is just as essential for our

wellbeing, for our industrial and economic life that this land be organized and managed for enduring timber production as it is that our agricultural land be organized and managed for enduring agriculture. Agriculture has thousands of trained investigators, forestry has practically none. Agricultural research is liberally supported by the public, research in the forest production is not. As a result our agriculture rests on a sure foundation, but our future timber supply is insecure.

## Research in Forest Production.

In building our structure in forest research, which I sincerely hope will not be overlong delayed, we must turn to agriculture, the problems of which concern the soil and crop production. What has already been accomplished in agricultural research points the way to what can be accomplished in forest research. In forestry as in agriculture there are two main lines of investigation, one relating to the production of the crop and the other to its utilization. In agriculture, research has centered around the production of the crop, problems relating to its utilization have been secondary. Research in forestry in America has to a large extent lost sight of crop production and has been centered in the problems of exploitation and utilization. Our research on the complex and diverse problems that lie at the very foundation of enduring timber production has just begun.

Today without the background of research in timber production timber land owners are at sea even when their desire is for sustained yield. They do not know which way to turn or how to proceed. They grope in the dark and are more often wrong than right. When a large forest land owner intent on regrowth collects hundreds of pounds of pine seed and subjects them to storage conditions which destroy their viability; when extensive plantations are made and later when growth falls off an unknown hardpan is discovered which inhibits growth; when excellent reproduction is unconsciously permitted to disappear through

It is a mistake to think that forests automatically grow the same quantity and quality of timber after they have been cut. To make a forest of spruce REPEAT ITSELF (without artificial planting) is an economic problem for which neither scientist nor lumberjack can give a simple formula. Only by experimentation will such questions be solved.



This photograph shows a typical condition in a cut-over pulpwood limit. What silvicultural methods are necessary to make this area grow new crops of spruce, in place of relatively worthless hardwoods or nothing at all?

If Canada is to maintain her forest crops, then forest administrators must find these facts.

competition with forest weeds; when forest protection centers in protecting the merchantable timber rather than the reproduction which is the only source of our future timber supply; when the economic value of reproduction and young timber is unappreciated; when scores of unrecognized and unknown factors which control reproduction, growth and yield, confront the forest land owner, it is no wonder that so little headway is made.

It is the special province of research through experimentation and reasoning from cause to effect to set the forest land owner right in his procedure toward sustained yield. Pulp companies and others who have already undertaken enduring timber production are forced to experiment and investigate as they go along. From their standpoint and from the standpoint of sustained yield, it is exceedingly unfortunate that the problems relating to reproduction, growth and yield which they find confronting them cannot be taken in hand by well trained and experienced research men and underlying principles established so that instead of

groping in the dark and following false leads, they would have available a fund of definite knowledge upon which a procedure could be established which with reasonable assurance would lead to definite results.

The need for research in forest production is a most pressing one in America today when we are making the first feeble efforts to turn from forest devastation to enduring timber production. Canada and the United States both with vast areas of potential forest land should spend as freely in research that leads toward keeping this land in continuous production as they do in research that leads toward keeping agricultural lands in continuous production. Stations for research in enduring timber production are needed in every timber producing province in Canada and in every timber producing state in the Union.

Forestry like medicine is largely an applied science. Progress in forest production like progress in medicine rests upon fundamental knowledge of the natural sciences. Knowledge of the tree itself is purely bo-

tanical and physiological science, knowledge of the tree in relation to external enemies leads into mycology and zoology, knowledge of the tree in relation to its physical environment leads into geology, physics, chemistry and climatology. Research in timber production, centers in reproduction, growth and yield. All of these have their roots in many natural sciences, a basic knowledge of which is indispensable.

Both ecological and statistical studies in forest production can be and are undertaken which aim at obtaining workable results in a short period of time. They are also undertaken when the aim is to obtain workable results through studies at given points in the forest over long periods of time. In the former case through studies in stands of every age, and under every condition of growth and development, we are able to visualize the entire life history of the forest. In the latter case by means of permanent sample plots, we study the development of the stand through its entire life history on the same site.

*(Continued on page 189)*



## The Highlands of Ontario

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## The Lumbermen's Interest in Reforestation

By W. B. Greeley, Chief U. S. Forest Service

**T**HE pressure of population and modern civilization upon natural resources underlies many of the economic problems of the world. The quest for new oil fields has become a large factor in international relations. The quest for new supplies of timber will not lag far behind. A recent survey of the forest resources of the whole earth shows that the accessible timber of the world is not adequate to meet the requirements of the twentieth century. The Forest Service has received inquiries representing Norwegian, English, and Japanese capital looking to the establishment of paper mills in Alaska. The experience of the World War has led England to embark upon a far-reaching and costly program of timber planning. International competition for high grade timber and for pulpwood will become more and more keen as time goes on.

It is easy enough to draw upon virgin timber for the enormous consumption of forest products in the United States as long as the virgin forests last. But with the sawmills of this country now in full migration westward to the Pacific Coast, the last chapter in the depletion of our virgin timber supply has begun. The real measure of timber depletion is not the billions of feet of stumpage remaining, but its availability to the consumer of the

manufactured product, in every day terms, the cost of transportation. The United States now moves over two million carloads of lumber annually, with an average haul of 485 miles and a yearly freight bill of \$275,000,000. The average consumer of ordinary building lumber in the United States today probably pays as much for freight as the lumber is worth at the sawmill where it is manufactured. It is this cost of transportation from the mills of the far south and the far west that is giving a tremendous impetus to reforestation in New England, where second growth pine 40 or 50 years old now often commands \$15 a thousand on the stump.

In short, purely economic forces are gradually changing the sources of raw

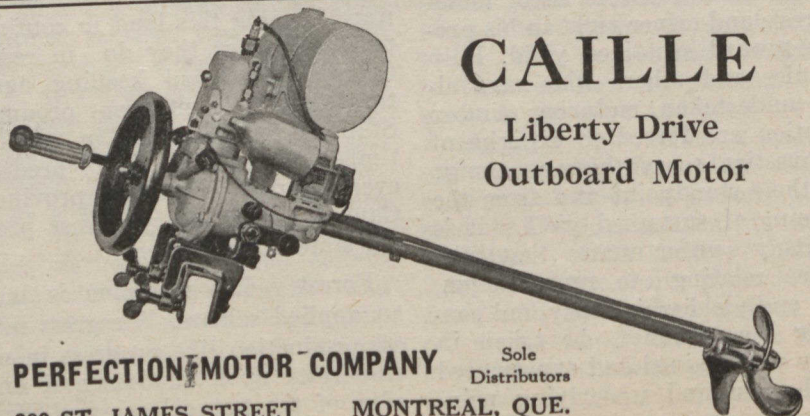
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Canadian Forestry  
Magazine, Ottawa, Can.

material for our forest industries from virgin timber to grown timber crops. One-third of the area of the United States is forest land, including the lands which once bore timber and are now unused for any other purpose. Three-fourths of this vast area lies in the Mississippi Valley and eastward to the Atlantic coast in the very states having the densest population, the most highly developed manufactures, and the largest consumption of forest products. The law of supply and demand is bound to put the greater part of these lands into productive use for the systematic growing of timber. It is written in the signs of the times.

A number of different forces will combine in bringing about general reforestation. Public forest ownership will take its part, but it can assume only a part. The reaction of the wood consumer, the newspaper publisher, the farmer, the fabricator of wood in innumerable industries, and the every day home builder, in the face of high prices and exorbitant transportation costs is already creating an active public opinion which demands that idle forest lands be put to work. This strong force of public opinion is supporting a larger measure of state and federal aid to reforestation every year. It will support public outlays for systematic fire protection. It will support adjustments of tax laws so as to encourage timber growing.



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# Experiments in Planting Timber Trees

By G. A. Mulloy, Dominion Forestry Branch

FOR some five years investigations have been carried on by the Federal Government in co-operation with the Laurentide Company of Grand'Mère, Quebec, in studying the problems connected with the production of pulpwood on cut-over lands and on abandoned

farms. The Laurentide Company has the largest private forest nursery in Canada, and has had an extensive planting programme in operation for some years. In connection with this planting work, experiments have been carried on to determine the best planting methods and the most suit-

able species to use under various conditions.

One factor that determines the method of planting that will give the most successful results is that dealing with the relative growth of first-class nursery stock in comparison with second-class stock.

## SOME GRAPHIC ILLUSTRATIONS OF RAPID TREE GROWTH



The accompanying photographs of an area of Scotch pine taken respectively at the time of planting in May, 1919, and at the time of remeasure-

ment in September, 1922, show the relative growth of first and second-class stock. The first and second-class stock were planted in alternate

rows, and the difference in growth is very apparent in the second photograph.

### SCOTCH PINE

5 year old Nursery Stock, Planted in May, 1919, Remeasured in September, 1922.  
4 years height growth—Heights in feet.

Permanent Sample Plot No.	Site Conditions	First Class Stock		Yearly Height Growth	Per cent. dead	Second Class Stock		Yearly Height Growth	Per cent. dead
		Ave.	Height			Ave.	Height		
		1919	1922			1919	1922		
VIII.....	Tough Sod.....	.09	3.0	.5	3	0.3	1.6	0.3	34
IX.....	Drifting Sand.....	0.9	3.4	.6	1	0.4	1.9	.4	14

The above table summarizes the height growth for trees in two areas planted to Scotch pine, Permanent sample plots No. VIII and IX. The figures appear to demonstrate for this particular locality, first, the preference of Scotch pine for bare sand as against sod, indicated by height growth and mortality; second, the quicker and stronger growth of first-class stock in plantations, as opposed to Second Class Stock.

As a matter of interest a new expression of growth may be suggested, i. e. acre height growth, that is the

total growth in height over an acre. This shows up more markedly the difference between the height growth of firsts and seconds than does the average growth.

	Firsts Acre-height	Seconds Acre-height
VIII—Tough sod.....	776 ft.	167 ft.
IX.—Drifting sand.....	950 ft.	537 ft.

It remains to be seen whether the additional cost of first-class stock will be balanced by the more rapid growth obtained by that class of material. Meanwhile it appears that the exclusive use of first-class stock is justified. In fact the company is acting on this supposition and is discarding all second-class stock in the seed beds, or before any costs of transplanting it have accumulated. Other experiments are being carried on elsewhere to establish the general application of this principle.

(Continued from page 157)

through the Forest Service, aided the industries in cruising the forests in order to locate available supplies. Walnut for gun stocks and propellers, locust for treenails for wooden ships, and tanning material, offered special difficulties. It was necessary to search out small tracts of timber and in some cases even single trees or groups of trees, in order to supply the industrial needs. A conception of the need for such material is clearer when one realizes that it was necessary to provide over 9 million gun stocks, 3 million hand guards, 6 million implements, 224,000 vehicles, 275,000 artillery wheels and miscellaneous other articles in proportion. It is estimated that not less than 50 million boxes and crates were required.

Special difficulties were encountered in the production of aircraft material. Early mistakes and long delays were



Gas Engine Starts Toward Mill with a load—United States Engineers near Eclaron, France, July 8, 1918.

due to a failure to appreciate the conditions under which the Sitka spruce grows. The tree is limited in its range on the Pacific coast, occurs scattered or in small bodies in mixture with other species, and is itself heavy and hard to handle. Moreover, only a small portion of each tree is suited to the exacting requirements of the aircraft specifications. The logging of large quantities of spruce involved special engineering difficulties. Production could not be speeded up as in the case of the southern yellow pine. It took many months to make clear that special measures differing from those used elsewhere were required. The plan finally developed by the Division of Aircraft Production was to organize special forestry troops for the logging. It built its own "cut-up" plant and dry kiln, and had under construction at the close of the war two railroads and two sawmills.

The United States undertook a large programme of constructing wooden ships. The original proposal was for 1,000 ships suited to transatlantic service. At the end of 1917, the Emergency Fleet Corporation had let contracts for 379 wooden steamships and 58 composite ships partly constructed of wood. Many persons doubted the wisdom of using wood for ship building because of the lack of seasoned material. It was believed, however, that this difficulty could be overcome by the use of heart yellow pine and Douglas fir, which have a very small shrinkage. A certain number of serviceable ships were built and used. Others gave a great deal of trouble, so much that this whole undertaking has been generally discredited. It is probable that if a less ambitious programme had been adopted, a longer time allowed for construction, and more rigid specifications for timber adhered to, the wooden ship would have been considered a success.

One of the largest uses of wood during the war was for the railways. Over 2,750 million board feet of material went into cross and switch ties, nearly 900 million feet of

lumber were used, for construction and repair of rolling stock, buildings and wharves absorbed nearly 250 million feet, bridges another 338 million feet, and nearly 200 million feet more were used for a variety of miscellaneous purposes. A considerable part of the total would have been used in any case for the maintenance of the railways if there had been no war. These requirements should, however, be included in a consideration of the war requirements as they constitute a drain on the forests that must be provided for, together with the uses that are in the emergency class.

In carrying out a comprehensive plan of national defense it is necessary to consider the rapid changes that are taking place in the forest and industrial conditions. Unless the General Staff keeps in intimate touch with these changes, the experience in securing wood supplies during the war will be of little value within five years. Of the material used by the army, over two-thirds was from southern yellow pine. Ninety per cent. was from the eastern forests. Fully sixty to seventy per cent. was from the vanishing virgin forests and was produced by large sawmills. We must now face the fact that our eastern supplies of virgin timber suitable for large quantity production are nearing an end. Not over twenty per cent. of large pine mills of the south have a supply of as much as ten years. Less than five per cent. control a supply of twenty years. It is estimated that at the present rate of consumption of softwood lumber the eastern states will be obliged by 1930 to import from the far west about 10 billion feet of lumber more than is



Hauling Sitka spruce in Oregon

brought from that region today. This does not mean that all the pine trees of the south will have been cut in ten years. But it does mean that the large mills capable of meeting quickly an emergency like that of 1917 will be gone and we will have to rely upon the small scattered operations for eastern timber. The conditions in the Lake states are even worse. The remaining white and red pine and hemlock forests are nearly cut out, so that the Pacific forests represent our last supply of virgin softwoods. A similar situation exists in the hardwood forests. The difference is that when the eastern timber is exhausted we have no other sources of supply in this country. There are no hardwood forests of importance in the west. Ten years will see a great depletion of the high grade oak, ash, hickory, elm, and walnut. What remains of the virgin hardwood timber at that time will be back in the



mountains or in the swamps, difficult of access, and not available for production in large quantities.

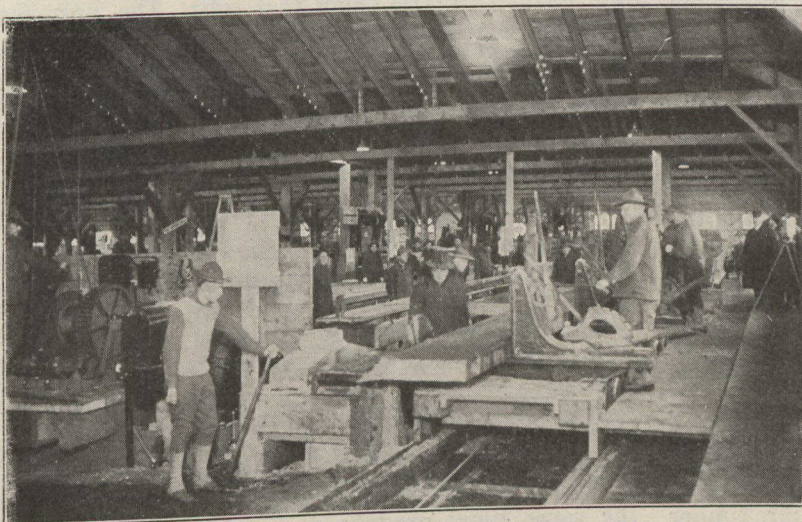
One can imagine the difficulties and confusion if it had been necessary during the war to transport the bulk of the general construction lumber for a distance of two or three thousand miles. We know the difficulties resulting from the congestion of traffic that existed without such a burden. We did not have ships to take the lumber through the Canal. It would have been necessary to transport it across the continent. It simply could not have been done.

The situation here described points to the necessity from the standpoint of national defense, alone, of having producing forests well distributed throughout the east as well as in the west. We can no longer rely upon virgin forests for our supplies to meet industrial or emergency needs. Vigorous measures are necessary to check the forest devastation that is now going on and to bring about a practice of forestry on all the land of the country that should remain permanently wooded. Forests are needed for the economic upbuilding of the country, they are needed as a reserve for emergencies whether occasioned by war or some economic situation. With the disappearance of the virgin timber, we will use an increasing amount of material from relatively young trees. The character of the lumber, the grades in common use, the species employed for various purposes, will be changing from time to time. The specifications of lumber for different purposes a few years hence will be different from those used during the war. Scientific research is showing methods of utilizing material formerly considered valueless.

Economic studies regarding our forests and the industries dependent upon them are being conducted by various civil agencies. Research is carried on at the laboratories in methods of seasoning, in lamination, in uses of wood fiber, in chemical products of wood, and in specifications for various products. Ordinarily, the problems of national defense are not given consideration

in these investigations. In case of forestry the existing research agencies are not today being utilized to the extent possible—in many cases not at all—in securing the information that appears essential to the army in planning for national defense. Every forest organization in the country would be glad to make some contribution to this public service. The participation of a large number of civilians in the programme of national defense would give it added strength, both through the direct results of their work and through the extension of an interest in these problems among scientific and industrial leaders.

Extensive forests, highly productive and widely distributed, are essential in the economic and industrial upbuilding of the nation. They are essential also in national defense. There is a vigorous movement for a much broader and more effective policy of forestry that we hope, will bring about a better handling of our forests. Assistance from the military departments and organizations is necessary to make the movement serve in the plans of national defense as well as in meeting our economic, industrial and social



Soldiers of Spruce Production Division, Signal Corps, turning out spruce for the aeroplane plants at the cut-up mill on the Pacific Coast.

needs. Preparation through having at hand full information about our forest resources and industries is obviously essential. It is equally important to have an organization in the Engineer Corps competent to build up quickly a body of experienced lumbermen and foresters, as was done in France. It is quite possible that our lumber industry at a later date may not be able to meet a sudden need for a great production of lumber and other forest productions. We might have to resort to a centralized direction of production under the army and to field operations by the army. The situation indicates the need of having a unit in the Reserve Corps organized for forestry operations. The existence of such a unit, capable of using the experience of the war and the current information described in the foregoing pages, would serve as a real factor in the preparation for contingencies that we may not now be able to foresee.

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Scores of readers of the "Canadian Forestry Magazine" make each copy do double work by mailing it to school teachers, clergymen, and other influential citizens of their acquaintance. One man mails his copies to Wales, another to India, but what we are asking now is that you give your copy to a school teacher, if possible. Two cents will accomplish this service. You might mark any special articles that you consider more than commonly worth while.

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## Briefs About People and Events

### THE EMPIRE AND FORESTRY

"It is not my intention today to make alarmist statements or quote panic figures. Without overstating one's case one can say, without fear of contradiction, that the world's timber situation gives grave reason for thought and enquiry. We read in the report of a recent American commission that timber is being cut at three times the rate of growth. We know that several exporting countries admit that they have over-estimated their forest resources. Whole groups of countries have been shut out of the timber trade by revolutions, dynastic changes, and the rise and fall in the value of exchange. Even if we do not accept the idea of a world timber famine, we must admit that never was there a time before in which the Empire depended more on its own efforts for its supply of timber; nor has there ever been a time more favourable than the present for urging the examination of our Empire timber resources."—Lord Lovat at British Empire Forestry Conference.

### N. B. FIRE EXPERIENCE

To date this season the forest fire loss in New Brunswick has been the lowest on record in many years, 80 fires having occurred over a total of 5,760 acres. Thirty per cent. of these areas contained merchantable timber. Of this total area 1,900 acres is crown land. Sixty per cent. of the fires did not extend over five acres each, while 9 reached an extent of 100 acres. With the exception of 10 fires these were all extinguished without cost to the government. The regulations requiring services for fire fighting without remuneration appear to have discouraged the practice of setting fires in order to provide employment. There have been 250 tie fires reported.

### A NEW BOX MATERIAL

A substitute for cardboard and wood in boxes is a chemical composition of sawdust and ashes. The finished boxes are light, washable, sanitary and non-poisonous. They are waterproof and as fireproof as asbestos and can be made in any degree of flexibility or texture, either as hard as oak, tough as metal or pliable as cardboard. A pound of the substance from which the boxes are made costs not more than five cents.

### CHINESE PREFERENCES

The Chinese prefer a paper of much softer quality for their correspondence than that made for the use of Americans. This is because the Chinese write entirely with brushes and ink. Wrapping paper of a soft, thin variety, light cream in color, is usually found in the better stationery shops, while the native shops sell a cheap brown paper.

### QUEBEC'S LAW ON CUTTING

"In all forests belonging to the Crown, no clean cutting and no operations constituting an exception to the regulations in force may be carried on without a special authorization from the Lieutenant-Governor in Council.

The license-holder who wishes to obtain such authorization shall make application therefor to the Minister of Lands and Forests, and shall, at the same time, produce a working plan based on a proper inventory and made according to the instructions of the Department of Lands and Forests.

The license-holder who wishes to obtain authorization to do extraordinary cutting in his forests on account of windfalls, fire, epidemics of insects, or cryptogamic diseases, shall apply therefor to the Minister of Lands and Forest and produce a plan showing the extent of forest so damaged."

### IS THE RANGE OVERCROWDED?

We hear much these days about over-crowded range, and the need for burning timber to improve the stock ranges.

It is interesting to note that the National Forests of the United States have an area of 156 million acres, which is estimated to contain 563 billion feet of timber and still leave room for grazing 9,500,000 head of stock.

This would indicate that the 92 million acres of timberland in British Columbia, containing only 360 billion feet of timber, should have ample fodder for the 50,000 head of stock for which permits are now issued, and leave some to spare. A visit to any of our high ranges will confirm this and show much fodder which has not yet been put to use.

From "Root and Branch" of the B. C. Forest Service.

### LUMBER INDUSTRY OF NOVA SCOTIA

The lumber industry of Nova Scotia, while it is not the foremost activity of the province, still holds a high place in its industrial life. The past season was by no means an active one, trade being dull in the Maritime Provinces, the same as in other parts of the Canadian commonwealth. A competent authority has estimated that the production of long lumber in Nova Scotia for export and sale to local yards, in 1919-20, was 350,000,000 feet, b. m., valued at \$10,500,000, and in 1920-21, 175,000,000 feet valued at \$3,500,000. The average value in the first year is put down at \$30 per M., and the latter at \$20 per M. these figures indicating approximately the difference in price in the two seasons.

These figures represent only a part of the forest products of Nova Scotia. There are besides,—pulp, cordwood, railway ties, barrel staves, pit props, ship timber, lath, shingles and other miscellaneous items of importance. The total value of the forest products of the province for 1921 is estimated at over \$10,000,000.

Last year Nova Scotia suffered a good deal from the forest fires owing to the prolonged drought. The number of acres burned was estimated at 77,000. The cost of fighting the fires was according to reports at the Legislative Buildings, Halifax, \$40,000, while the estimated damage reached three times this amount.

### LIQUID AIR CRACKS NUTS

Liquid air for cracking nuts is the latest application of science. Experts at the National Bureau of Standards in Washington were appealed to for a method of breaking the shells of chicha nuts without damaging the kernels. They found it took a weight of nearly a ton to crack the nuts, and that after the effort the meat of the nut was broken in many small pieces.

Then they applied liquid air to the problem. They did not freeze solid a piece of rubber and use it as a hammer, as is done in the classic stunt of physics classes, but they simply immersed the nuts in liquid air for thirty seconds and cracked them easily without damage to the kernels. Now the physicists are trying to find out whether this method can be applied commercially on a large scale.

## AS OTHERS SEE IT

### COAST FORESTS CUT INTO

(Pacific Coast Lumberman)

While it is a general assertion not pretending to be accurate, the statement that 60 per cent. of the standing timber of the State of Washington has been cut off without profit to timber holder, logger, or manufacturer, is one that has more truth than poetry in it.

Instability; boom or slump; feast or famine; has been far too great a part of the history of the lumber business of the West. Already the extent to which our B. C. coast timber is being cut into is becoming very visible on the map, and it is certainly time that we studied every way in which production can be made less unstable before the inroads into our forest assets become more severe. Closer utilization of stumpage, and getting the very best out of the log and out of manufactured lumber are ideas which are steadily replacing the old time western idea that lavish waste at this stage of lumbering was inevitable.

### FORESTS AND WATER FLOW

(Australian Forestry Journal)

Mr. W. R. Holmes, one of our well-known engineers, recently said: "Engineers and all local authorities throughout New Zealand should maintain a constant campaign against the denudation of our forest-clad mountains and ranges, not only on account of the loss of valuable water during floods, but on account of the enormously-increased quantity of detritus washed down from the bare hills to detrimentally affect all storage reservoirs which may be constructed in such localities. The maintenance of an equable flow in the streams, for the use of posterity, is of far greater natural value than the endeavour to maintain a few sheep on what must become almost barren country. What he thought the Government engineers should do was to support the Forestry Department in its endeavours to obtain control of as much of the forest territory as possible." The importance of this advice cannot be over-emphasized. Mr. Holmes, with his long experience of our rivers and climate, and with matured judgment, urges the mem-

bers of his profession to "support the Forestry Department." The evidence of the necessity for this to future generations is overwhelming, and should induce public opinion to be more pronounced than ever that the remaining forests should be under the control of the Forest Service, and that, after demarcation, any land cut out as suitable for settlement be handed to the Lands Department for disposal, and not leave the decision in the hands of the latter department.

### DOING A GREAT WORK

Tomkins, Sask.

Canadian Forestry Assn.

I have myself a very good shelter belt on my farm and I can assure you it adds greatly to the appearance of the home and I certainly think you are doing a great work in educating people of the West to plant trees.

Wishing you continued success.

Yours truly

C. H. HARNETT.

### U. S. LUMBERMEN TURNING TO FORESTRY.

(An Editorial in "American Forestry")

**A**MERICAN lumbering is in the early stages of evolution. It is turning to the principles of forestry. This trend may not be perceptible to the average citizen. It probably is not, but it is nevertheless true that in almost every timber region of the United States lumbermen may be found who have, within the past five years, turned to some form of forest management. Their number, of course, is relatively small, but their action is highly significant. They have not been prompted by sentiment. They have studied the ground, looked into the future, and have made up their minds that forestry embodies the business principles with which to meet economic changes pressing in upon them.

In the last issue of American Forestry, mention was made of the fact that some of the largest of the redwood companies had just decided to apply forest management to their lands. Down in the piney woods of the South the same trend is in

evidence. The Director of the Southern Experiment Station is authority for the following statement:

"The best proof we can present that some measure of forestry is at least feasible, and frequently profitable, is the surprisingly large number of southern pine manufacturers who are today putting into effect on their own land measures very like our requirements. The Jackson Lumber Company of Lockhart, Alabama, has since the beginning cut no trees below a high diameter limit, now about 20 inches. The Kaul Lumber Company of Birmingham, Alabama, for years followed a plan of conservative cutting drawn up by the Forest Service in 1906, and has gone back to it again after the lapse of a few years during the war. The Alger-Sullivan Lumber Company, Century, Florida, has very recently begun work on a forestry program.

"The Allison Lumber Company of Bellamy, I am told, has gotten to the point where they are confident of being able to keep fire out of their slash and to preserve the young growth for a future crop. The Tatum Lumber Company of Jackson and the Batson-McGhee Company of Millard, both in Mississippi, have been cutting conservatively for several years and attempting fire protection on their lands. Most of you are familiar with the policy of the Great Southern Lumber Company in reproducing its forests as a basis for making Bogalusa a permanent city. I have already mentioned the Urania Lumber Company which for several years has been preaching and above all practicing forestry in Louisiana."

In the Lake States no less keen and practical a man than Henry Ford is practicing forestry—not as a fad but as a part of his automobile business. In the Northeast, a number of lumber and pulp companies have employed foresters and are proceeding along lines of permanent operations. These men are real leaders in their chosen fields. They are the vanguard of the industry's progressive wing. They are practical, far-seeing men, whose example belies the declaration of many lumbermen for years that forestry is not practicable. For these pioneers in the practice of forestry in this country, American Forestry has the greatest admiration, and it bespeaks for them the public recognition and co-operation which they justly deserve.

# THE INVESTMENT FIELD

Specially Written for the Illustrated Canadian Forestry Magazine

*In line with our policy of broadening the scope of The Illustrated Canadian Forestry Magazine, we publish regularly a Financial Section in which various phases of the Investment field are reviewed. This Section is written by a thoroughly competent and entirely reliable financial authority who will each month prepare an article of special interest to our readers. Needless to say, the department will be conducted along purely informative and educative lines, without any attempt to influence our readers unduly in their financial undertakings.—EDITOR.*

**T**HE steady rise in sterling exchange, which at the time of writing is within four or five per cent. of normal, is one of the most remarkable incidents in post-war finance, and carries at the same time great significance for the investor.

It has been remarked that "unquestionably the greatest single barometer of world health is the rate of exchange on England." The rapidity of the return to normal of the pound sterling in the face of a host of theories as to the impossibility of a \$4.86 2-3 rate for many years to come, will bring about a readjustment in financial and industrial conditions so far as the most important single factor in the world is concerned, much more quickly than had been anticipated by even the most sanguine. The recovery of sterling will reverse a condition for securities where England was selling in Canada and the United States when the discount was heavy, into a position where the English investor will again be in the Canadian market as a provider of loans, and perhaps once again the most potent element in the development of the industrial resources of this country.

In other words, New York financiers are beginning already to count on English money replacing in large part that of the United States in the subscription to Canadian loans, whether they be Government, Provincial or industrial. Interest rates already over there are much lower than in Canada, with call loans common at two per cent., and the Bank of England rate at three per cent. Competition with New York for Canadian bond issues seems now a matter of only a few months, and a return to a large extent to the condition that prevailed before the war when England took care of practically all the outside borrowing requirements of Canada.

More than that, the improvement in sterling is certain to place England in a far better position to buy Canadian as well as United States products, and the export trade of Canada, which has been improving in a most gratifying manner of late should show even heavier gains in the positive direction in the near future. With the industrial outlook brightening for this year, and an enormous quantity of surplus money on hand among the banks and other institutions, not only for industrial needs but for investment purposes, the general outlook for an appreciation among good securities of all descriptions is most promising as the year 1923 gets on its way.

## The Warning of the "Slump."

Before the gloom that was engendered in the buyer of securities on slender "margins" during the latter part of November and the first half of December becomes dissipated in the brighter outlook with which the year closed, — although followed by a further set-back through the Franco-Germany impasse—it is well to sound once more a warning against this form of investment. For the most, indeed, it becomes a mere matter of speculation. Perhaps the first point that impresses the student of the situation is the suddenness with

which the movement changed from an upward to a downward slump. Apart from a stray voice or two crying in the wilderness of a bull-market—and their warnings invariably are disregarded,—the great majority of brokerage and other investment houses were unprepared for the sudden reaction in the market. The "war scare" came over night, and this operated disastrously on the Canadian market. The New York market, with the United States from a political standpoint more remote as a possible actor in the Far Eastern affair, was only moderately affected, but immediately afterwards the market reversed and a long period that developed into a "bear" movement ensued. The Canadian market followed New York in a secondary relapse after the war scare tumble. It is quite true that the Canadian market behaves on an average much better than New York for the simple reason that there has not been the sharp upward movement of the larger markets.

Even as it was stocks dropped without warning, five, ten and even fifteen points, and once again a large portion of marginal speculators of small means were wiped out. The "instalment" buyer was saved. Perhaps his security declined five or ten points, which would have meant a calling of further margins for him, had not his first instalment protected him according to agreement, and the investment house covered the temporary decline. The buyer himself, confident in the ultimate come-back of a legitimate investment security, was able to sleep quietly, without the anxious figuring over "margin" losses that proved so disturbing a nightcap to his marginal friend.

## A Dangerous Game

Let it then be emphasized once for all—before more definite suggestions are made in future issues as to individual groups of securities or even individual ones—that the marginal buying of securities, particularly of "common" stocks, is a dangerous game for the man of small means to attempt. The time to impress this is now—when heavy losses have been widespread among those who "invested" the full extent of their capital, and when the break came—suddenly and without warning as is the case so often and almost always,—they had no reserve to cover the amount of the decline in the stocks they held, and so were forced to sell out at the lower levels all the stocks they carried, losing a large part, if not all, the capital they had expended.

The stock market is tricky. New York has always two main groups, the "bulls" and the "bears", the one constitutionally and persistently an optimist, expecting and influencing a rise, the other, similarly disposed towards a falling market, with manipulation, especially in times of weakness, a most rampant force. The Canadian markets are less professional; there have been, as yet, comparatively few "bear" movements preceded by and influenced by "short" selling. The New York market is favored by many purchasers because they are assured

of quicker action—up or down. When they want to sell they can find a purchaser at current market levels. For the smaller trader, however, it is more dangerous than the Canadian, in proportion as the fluctuations within brief periods are the more pronounced.

It is not suggested here that the broader movements in New York, as in Canada, are not influenced by main fundamental conditions, such as an improved industrial outlook. This is just what the "long pull" investor experiences. But, recurring within these extended upward or downward swings, are the violent fluctuations that usually prove the undoing of the amateur,—he never knows when he has made enough and it is time to get out, in the one event, while on the toboggan slide he hardly realizes the danger approaching and it is on him,—and he is lost, financially,—before he understands.

A long-pull investment, on the instalment plan, or bought outright, is the only logical method for the investor of small means, or even the "large" one, unless he deliberately wills to take a gambling chance.

### A Question Answered

Q.—I am planning to plant spruce trees on several hundred acres. Where can I obtain the seed to start a nursery?

A.—You would be better advised to secure seedlings from the Quebec Government nurseries at Berthierville, P.Q. or from a commercial nursery, instead of putting your money into the planting of seed. Spruce seed has been very scarce in recent years and quite costly.



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## Winter Carnival at St. John, N. B.

THE CANADIAN Forestry Association had an opportunity recently of reaching over 6,000 persons during the Winter Carnival at St. John, N.B. On the invitation of the Department of Lands and Mines, Mr. G. Gerald Blyth, Assistant Secretary of the Association, was sent to St. John to attend the Sportsmen's Show, from February 10th to 17th. Mr. Blyth took with him motion picture equipment and films. The Department of Lands and Mines which was responsible for the Sportsmen's Show, in co-operation with the New Brunswick Guides' Association had secured a large hall in St. John which was very appropriately decorated, the walls being adorned with many wonderful specimens of big game heads from all over the province. At the front of the hall was a splendid collection of stuffed game animals and birds. Officers from the Department of Lands and Mines on hand, taking part in the show, were G. H. Prince, Provincial Forester, L. A. Gagnon, Chief Game Warden, C. A. Williams and H. Bradbury. The New Brunswick Guides' Association was ably represented by two of the best known guides in the province, Messrs. Harry Allan and Charlie Cremin. Mr. R. W. Tufts, Chief Migratory Bird Officer for the Maritime Provinces was in attendance and delivered some interest-

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Minister of Agriculture

ing illustrated talks on bird life. Thirteen public meetings were held during the week with a total attendance of 6,250, of which 3,250 were adults. Through the courtesy of the local school authorities a large number of the older school pupils attended morning and afternoon sessions. Three meetings a day were held and Mr. Blyth addressed each meeting on the subject of Forest Conservation and Forest Fire Prevention, illustrating his talks by motion pictures.

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| <b>LE MARECHAL FOCH</b> ,—Pink.         | <b>LOVELINESS</b> ,—Creamy yellow.                  |
| <b>PARLIAMENT</b> ,—Salmon-rose.        | <b>Mrs. FRANK PENDLETON, Jr.</b> ,—<br>Salmon-pink. |

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**Research as Aid to Forest Production**

(Continued from page 177)

In statistical studies of growth, we fell representative sample trees in a given stand and by methods of forest mensuration determine the rate of growth in the stand for a variable length of time reaching into the past, or we lay off permanent sample plots which are measured at intervals throughout the life of the stand.

consequence of present outlay, when and how should cleanings and thinnings be made and what financial advantage will result therefrom. He has put these questions to foresters, but they cannot tell him because there is no definite body of dependable data based on research which applies to his particular problems.

The problems of forest production are too large to be left to the individ-



A plot of mixed white pine and birch at the Petawawa Forest Experiment Station. The plot has been thinned and the trees marked so that their subsequent growth may be determined. The piles of thinnings were removed and utilized.

In these cases, we aim for the same results by short time studies that we do by long time studies. Although short time studies are of great value in securing useful information, it is only through the establishment of permanent sample plots, continued for a long term of years that accurate basic data on forest production can be acquired. In short, the scientific basis for timber production rests in the intensive study of representative areas of our diverse types of forest often extended over a long period of time. The sample plot method must be used in studying the yield of seed, in studying germination and survival in the field and nursery, in studying growth and yield, in studying succession or the evolution of forest vegetation on a given site, and in observing and recording every change in the stand whether it be in the surface vegetation, in the shrubs, or in the trees themselves.

**Where Should Research in Forest Production Rest?**

A large forest land owner was in my office a few days ago who wants to establish sustained yield on his property. He is willing to expend a large sum of money in the enterprise as soon as he can see that economic results will justify the expense incurred. He wants to know how he is to attain reproduction, what

growth and yield will follow as a goal for his solution. They must be solved by the public for the benefit of all. Research in forest production demands permanent organizations supported by the public. These permanent organizations must have staffs of thoroughly trained efficient investigators attached to forest research stations. We find these stations now in nearly every country where forest production is recognized as a matter of national concern. In recent years they have been established in the United States and I am told that Canada looks forward toward their establishment on this side of the line.

The splendid work done in Austria, Switzerland, Germany and India are but examples of the great good and the impetus to better forestry that flows from well organized productive work of this nature. The efforts of foresters in these and other countries working at or through forest research stations have given the old world a body of information based on research which lies at the very heart of their silviculture practice.

As I see it, the greatest need in forestry on this side of the water today is adequate well organized research in forest production. Even the forest research that we have overemphasizes the problems of utilization and almost ignores the great

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far-reaching basic problems of reproduction, growth and yield which must be solved before we can hope for sustained yield and silvicultural betterment. Silviculture is the weakest link in American forestry today and it ought to be the strongest.

The forest land owner wants to know what he ought to do and what he can do in his forest in order to attain sustained yield without financial loss. He wants to know how to get the fullest use out of his property consistent with profitable use. He wants to know if a certain procedure will result in profit or loss, or will give him a fully stocked stand of young timber. He wants to know if three dollars per acre spent in cleanings is a profitable use of his money. Are we foresters of the western world with our woeful lack of specific knowledge derived from research and experimentation bold enough to answer? If we do, we are as likely to be wrong as right. If we are to give reliable silvicultural information, we must have reliable silvicultural conclusions drawn from painstaking and trustworthy research.

The importance of research in timber production is appreciated much more in Europe than in America. This is shown in the preponderance of sil-

silvicultural investigation in their forest research stations and the long training in the natural sciences back of their research workers. It is emphasized even more in the newer stations than in the old. Thus, Finland with only five per cent. of her total area under agriculture depends upon the maintenance of timber production for her future prosperity. Much the same, the enduring prosperity of some of the provinces of Canada depends on what is done in bringing about sustained timber production. Finland in establishing her forest research institute in 1917 fully appreciated the importance of research in forest production. The purpose of this institute is to study by scientific methods the questions important in forest production; questions which are extremely difficult or altogether impossible of solution by private individuals. The institute is divided into three sections each with its own branch of work and headed by an experienced man of proved ability having the same qualifications as required for a chair in the University, and in addition, experience in practical forestry. The investigations required are recognized as of high scientific order which cannot be entrusted to inexperienced men. The lines of investigation in the three sections are: silviculture, forest management and forest soils, all of which bear on forest production. It will be noted that in this institute the problems in utilization are relegated to the background, as being of less basic importance.

Research in timber production of both an ecological and statistical nature are illustrated in the following: Meteorological studies, forest soil studies, distribution of species and types; seed and germination studies; natural and artificial reproduction; effects of cleanings and thinnings; growth, volume, and yield studies, and the effect of the site on the technical properties of the products produced. All of these and similar studies are beyond the ability of the individual investigator and can only be effectively undertaken by research stations or institutes under governmental or institutional control. In short, our serious research in timber production is the special province of governments and of educational institutions, more especially the larger universities. The great objection to having all research in forestry centered in the government is the effect of public pressure in forcing undue emphasis on the investigation of all sorts of unrelated subjects often of

little or no basic importance and the ignoring of the more basic problems which often take years for solution, but which in the end are of far greater importance. University research is not subjected to this same kind of pressure and on the whole there is more hope for basic research in the University than in the government. For this reason, it is my hope that research in the great problems of enduring timber production will rapidly increase in educational institutions and make an important part of the work of at least a considerable number of our schools of forestry and departments of forestry. Some of the forest schools are already doing considerable research in the pro-

blems which control timber production. As yet, however, in America, the work lacks organization and established plans. If these institutions can establish forest research stations or institutes with separate budgets and with full time and part time workers as we have in our agricultural experiment stations, which are usually adjuncts of educational institutions, we will place our forest research on a sound and enduring basis. We must have agencies of high scientific order to solve our many silvicultural problems. This, in my judgment, is the greatest need in American forestry today and is certain to become an increasing need with the passage of time.



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(Concluded from page 164)

by us in preparing the way for conscious effort in continuous forest have 150 million acres of soil in Eastern Canada better adapted for tree crops than for farm crops. And think of the transportation facilities in that vast area? At the southern edge of it, a great river already navigable to ocean traffic for nearly a thousand miles inland. Navigable to boats of 14 foot draft for an additional 1400 miles inland. Perhaps some day navigable for the entire length of 2400 miles by ocean-going freighters, if the proposed St. Lawrence ship canal ever becomes more than a dream. At frequent intervals along the entire length of this great river, tributaries come from long distances to the northward. Some of these tributaries are great rivers themselves nearly 800 miles long and furnish log-driving channels for more than 80,000 square miles of forested country. These river valleys, also, form natural routes for railways that penetrate into the hinterlands. At least three through lines traverse a large portion of the area from east to west. No other forest region of its size in the world is so accessible by water and by rail.

**Some Pulpwood Statistics.**

The Atlantic seaboard states and those of the Mississippi valley are tributary to the forest region of Eastern Canada. They contain a population close to one hundred million. Their own forests do not now meet their needs and there is good reason for believing that their present supplies will be exhausted within a few years. These eastern states have drawn on Canada for certain forest products for years, notably for white pine and spruce lumber. As you know, in recent years there has been an enormous development in the export of pulpwood products. In 1920, for example, Canadian mills furnished the United States \$62,700,000 worth of pulp and \$63,000,000 worth of newsprint paper, and \$16,000,000 worth of unmanufactured pulpwood, a total of practically \$140,000,000. The latest figures I can get from the United States are those of 1918. Using these as a basis, and if we convert the paper exported to the United States in that year into the cords of pulpwood required to produce it, we find it is the equivalent of 791,000 cords. Using the same converting process, we find that it required 863,000 cords of pulpwood to make the pulp exported to the United States. In addition to this, we exported to the United States in 1918,

1,350,000 cords of unmanufactured pulpwood. Adding these figures to production. We have a climate that grows trees with fair rapidity. We gether, we find that Canada sold to the United States the equivalent of 3,000,000 cords of pulpwood, which was 44 per cent. of all the pulpwood used in that country, and those 3,000,000 cords represent more than four-fifths of all the pulpwood cut in this country in 1918.

The pulpwood statistics show another important fact, and that is nearly 40 per cent. of all the pulpwood cut in Canada in 1918 went to the United States in the rough to be manufactured into pulp and paper in American mills by American labor. Canada got about \$15,000,000 for the pulpwood thus exported, whereas, if it had been manufactured here, in the relative proportions of pulp and paper and exported as such, that amount of pulpwood thus manufactured would have placed some \$90,000,000 in circulation in this country. This doesn't look like a good

business proposition, to say nothing of the fact that such a great drain from our forests will eventually seriously handicap our own mills.

With an adequate forestry program, we could in the future replenish the diminishing supplies in the eastern states with lumber and paper made in Canadian mills by Canadian labor. We could doubtless extend our lumber trade with Great Britain and there are also South America markets that might be still further developed.

No other forest region in the world contains such a large number of commercial species and so widely adapted to various uses, or has so large contiguous areas so well provided with transportation facilities and so easily accessible to great and growing markets as that of Eastern Canada. This vast area properly stocked and under intelligent use for forest purposes could supply the markets of the world. Shall we accept the challenge which God in his wisdom has laid before us?

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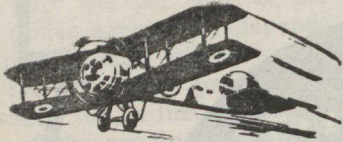


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# AERONAUTICAL SECTION



A department devoted particularly to the application of aerial methods in forest conservation and generally to the promotion of sane civil aviation in Canada.

## GEN. MITCHELL, U.S.A.S., OPTIMISTIC

By George A. Mackie.

CANADIAN aviation circles have recently experienced the pleasure and inspiration of a visit from two aeronautical experts from other countries, in the persons of General William Mitchell, assistant chief of the United States Air Service and Commander Christie, C.M.G., D.S.O., M.C., Attache of the Royal Air Force, British Embassy, Washington, D.C.

These two experienced pilots flew in separate machines from Detroit, Michigan, to Camp Borden, Ontario, a distance of 195 miles in one hour and forty minutes. While their flight was an entire success, the same cannot be said of their landing. They had failed to act on the advice of Canadian aviation officers who recommended that they replace the wheels of their landing gear with ski runners. As a result the wheels of their machines were destroyed through landing in deep snow and the further trip from Camp Borden to Ottawa was made by train.

In the course of an interesting address before the Canadian Club of Ottawa, General Mitchell expressed his opinion that Air Services for all forms of transportation in time of peace, with radio as a necessary auxiliary, would in time be as cheap, irrespective of the great speed, as safe, and, perhaps, more practicable than present means of transportation and communication. Transportation by air was to him the logical transportation, where water and deserts and mountains provided no barriers. Air roads were limitless. A height of 44,800 feet had been reached. The only thing that curtailed an aviator was engine capacity and reliability, and these were increasing every day. There was no question that the present engine would be improved greatly. It would soon be possible to circle the globe on one charge of gas.

The War had brought big development in aeronautics. A country without an air service would have been immeasurably hampered and beaten by an army having such a service. But then the air service was used only for short distances as a rule. In the next war all would be changed. Aeroplanes would be mobilized in a minimum of time. Now the power of water to hit was being employed. A charge of trinitrotoluol, exploded in water, had many times more effect than if exploded in the air, as it made the water like steel.

General Mitchell told of his landing at Camp Borden a few days previously, and being driven eight miles to a railroad station, which had taken as long as to fly the 200 miles from the United States, a matter of a hundred minutes. One horse could drag 1,000 pounds 21 miles a day. In the air, an aeroplane could take 1,000 pounds 400 miles a day. There was nothing remarkable in taking one's lunch in Washington and dinner in Chicago or Milwaukee. It cost about 60 cents a mile to travel by air in a 400 horse power machine.

Civil aviation might be so organized that it would be less hazardous than other transportation means. The cost, which was now three times as

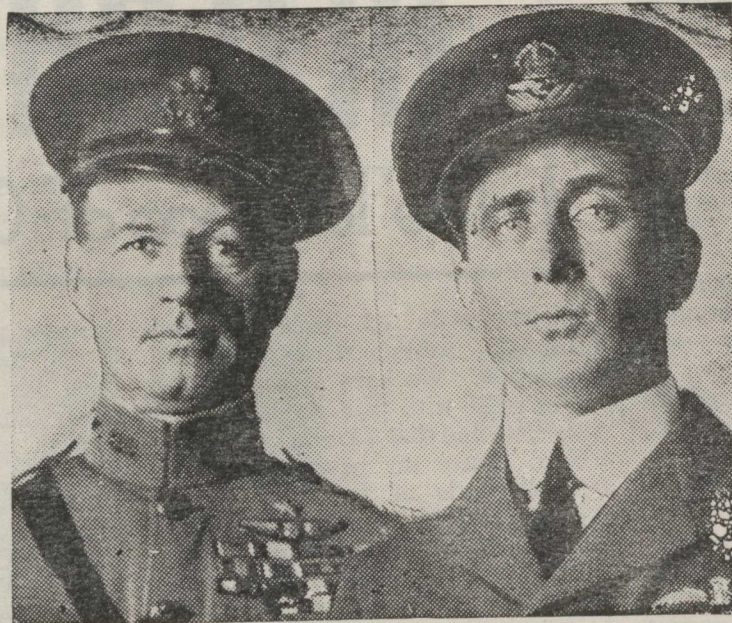


Plate reproduced by courtesy of the Citizen, Ottawa.

Gen. Mitchell (left) assistant chief of the United States Air Service and Commander Christie (right) air attache of the Royal Air Force, British Embassy, Washington

much as on railroads was being constantly reduced, and in time it would be much lower, irrespective of speed.

The Canadian Air Board was congratulated upon its efficiency. General Mitchell thought the problem of flying in Winter would be solved in Canada. That done, Canada had easy and quick access by the north to Europe and Asia. The Winter provided landing places everywhere except in timber limits. Aeronautics would solve the country's geographical drawbacks, and people could go straight through to their destination. All that was needed was organization.

# A STEP FORWARD

For some time past, plans have been under way for the production of Canadian-designed Canadian-built aircraft. The necessary organization has now been completed by the appointment of:

MAJOR D. C. M. HUME, A.M.I.E.E., A.F.R.Ae.S., M.I.Ae.E.,

as

Designer and Director of  
Technical Branch.

Major Hume is one of the pioneer designers of the British Aircraft Industry and has had over seven years experience in design and production of seaplanes and amphibians.

A staff of competent technical and practical engineers has been secured to undertake the production of special types for fire patrol, photography, aerial surveys, and transportation, providing for the extension of our field of service to Canadian forestry interests.

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# Building Aircraft in Canada

Prominent British Designer Joins Staff of Laurentide Air Service Ltd.

**A** VERY IMPORTANT step toward the establishment of a Canadian aircraft construction industry has occurred recently with the arrival from England of Major D. C. M. Hume, A.M.I.E.E., A.F.R.Ae.S., M.I.Ae.E., who has been appointed as Technical Director and Aircraft Designer of Laurentide Air Service, Ltd. Major Hume is one of the pioneer British designers and was in a large measure responsible for much of the important development of the Naval Branch of British Aviation during the War, and was one of the original members of the Admiralty Design Staff in which capacity he was closely associated with Col. Stedman, who is now Technical Director of the Canadian Air Force, and in this capacity has technical control of all Government aircraft development in Canada.

It is learned from officials of the Laurentide Air Service, Limited, that one of the big handicaps in Canadian Aviation to date has been the lack of types especially adapted to Canadian conditions and their venture into the field of construction is taken with a view not only to the development of new types for different phases of Canadian aircraft operation, but also with a view to ensuring that their present plant and equipment shall be used to the greatest possible advantage and shall be kept thoroughly up-to-date. The organization of this branch has been under way for some time, and has in-

involved securing a number of both practical and technical engineers to carry on the many duties involved in the construction of aircraft. The appointment of Major Hume marks the completion of the staff required with the exception of one or two technical positions.

Major Hume in an interview shortly after his arrival stated that he had been largely influenced in his decision to come to Canada by the fact that the opportunity in Canada for operation of seaplanes and flying boats appeared to be greater than in any other country of the world. Natural conditions here, are ideal for the operation of seaplanes and vast natural resources and forestry industries ensure a broad and profitable market for aircraft operation when public opinion has been brought to the point of supporting the work.

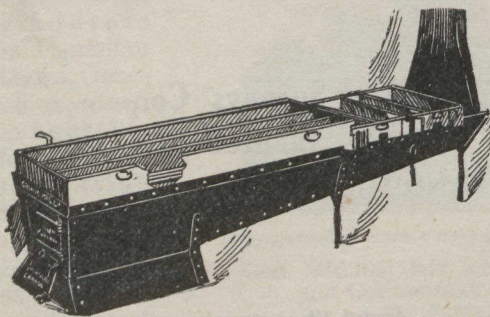
Major Hume stated that his work during the War brought him into touch very closely with many Canadian pilots and other personnel and he was very much impressed with their energy and initiative, which qualities are essential to successful commercial aircraft operation.

While no plans have, as yet, been made public, it is learned that the first type to be constructed is a medium-sized flying boat for Fire Patrol and Photographic work. The company's building programme will be carried on at Lachine, P. Q., in conjunction with one of their associated companies, Montreal Boat Builders, Limited, which has an extensive plant engaged upon the production of high-class motor boats and yachts, a type of construction which is closely allied to the production of aircraft.

It is expected that some announcement will be made very shortly of the production of one or more types by Laurentide Air Service, Limited, and this development will be awaited with considerable interest by all those interested in the development of Canadian Aviation.

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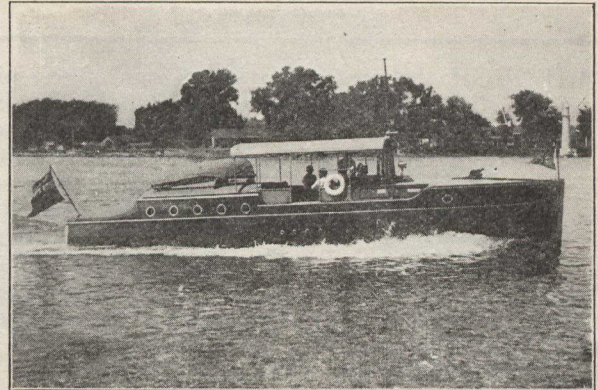
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## Aerial Activities in Canada

**T**HROUGH the prompt action of one of the pilots from High River Air Station, Alberta, a large tract of valuable forest in the Bow River Reserve was saved from inevitable destruction late in October, 1922. The weather had been exceptionally dry for some weeks, and the pilot while flying over the Bow River Valley on the 25th October noticed a small fire burning on the western edge of a large block of valuable timber. Realizing the danger he landed near the Indian Reserve at Morley to ensure that measures were taken to cope with it before it assumed large dimensions. With the help of the fire ranger and the Indian Agent a party of men were despatched immediately to the scene of the outbreak and further help was sent in next day with the result that the fire was subdued before night.

Next day the strongest gale experienced during the season sprang up from the west and had the fire not been mastered it is certain that a very large tract of forest country would have been utterly destroyed.

In the opinion of the District Forestry Officer, the value of the timber saved by this prompt action more than justified the expenditure necessary to maintain the Air Station during the whole season.

### Eighty-four Fires Discovered

The report of the Officer in Charge of the Aerial Fire Patrol over the Algonquin Park District during the past Summer shows that no less than 84 fires were discovered and reported by means of aircraft during the Summer.

In addition to the detection of fires in many instances

the Chief Ranger was enabled to size up the situation from the air in a way he could not possibly have done from the ground, and so dispose his forces to fight the fires in the best possible way.

On other occasions when fires threatened to get beyond the control on a windy day a portable pump and extra equipment and men were rushed to the scene of the fires and serious conflagrations prevented. The resultant saving of timber and fire fighting cost in a few cases of this kind would amply cover the expense of the maintenance and operation of the Air Station.

### Mapped by Sea-planes

Eleven million acres of the forested area of Patricia, which will be tapped by the James Bay extension of the T. and N. O. Railway have been completely mapped by the Ontario Department of Lands and Forests. The information was mostly gathered by seaplanes last Summer, observers sketching in the tree covered areas from aloft and later checking up the information by ground parties. The result has all the features of the standard survey method with the additional accuracy and remarkable speed which only the aircraft can supply. The entire job was accomplished in a fraction of the time formerly occupied by forest surveyors operating from the ground.

### Plane Killed Caterpillars

Last fall in Ohio a six acre grove of Catalpa trees contained 4,800 trees, 25 to 30 feet tall, which were badly infested with caterpillars was covered with poison by an aeroplane which took not more than 54 seconds to do the job. The experiment demonstrated the ability of the pilot to place the poisonous stuff where desired and at the same time, the effect on the caterpillars was most gratifying, since it was estimated that 99 per cent were destroyed. This experiment was conducted by the Ohio Government experimentation and the results as given are official.

# VICKERS "VIKING" AMPHIBIAN

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"VIKING" MARK IV, Six passengers and baggage or 1,360 lbs  
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The Viking' was the winner of the First Prize of £10,000 for the Amphibian Class of Aircraft entered for the British Air Ministry Competition, Sept., 1920.

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*Vickers "Viking" Amphibian on the Thames.*



## Air Board Statistics

**T**HE AIR BOARD announces Civil Aviation Certificates and Licenses issued, cancelled and renewed, under the various classes as shown for the month ending January 31st, 1923, as follows:

### Private Air Pilots' Certificates

Renewed.—R. A. Logan, Middle Musquodoboit, N.S.  
Lapsed.—B. S. Ashley, D. M. Ballantyne, Montreal; E. G. Corey, Brantford; E. P. Cavanagh, Smith's Falls; C. H. Cameron, Ottawa; F. Cameron, Watson, Sask.; J. R. S. Devlin, Ottawa; W. H. Emery, Bradford, Pa., U. S. A.; W. H. E. Graham, Clinton, Ont.; R. E. Hartz, Marshfield, P. E. I.; J. W. Hobbs, Sault Ste. Marie, Ont.; C. K. E. Kennedy, Montreal; D. R. MacLaren, Vancouver, B.C.; H. G. Miller, Winnipeg; C. W. McKissock, Weston, Ont.; M. H. McManus, Mattawa, Ont.; R. H. Nisbet, Chicoutimi, P.Q.; H. G. Robinson, Toronto; E. M. Ronne, Buffalo, N. Y.; E. B. Sutherland, Ingersoll, Ont.; A. N. Thomas, Toronto; G. A. Wrigglesworth, Didsbury, Alta.

### Commercial Air Pilots' Certificates.

Renewed.—G. R. Howsam, High River, Alta.; G. E. Brookes, Winnipeg, Man.

Lapsed.—E. G. MacPherson, Moose Jaw; D. B. Foss, Sherbrooke; J. H. St. Martin, Montreal; K. F. Saunders, Victoria; H. S. Quigley, Toronto.

### Certificates of Registration of Aircraft

Cancelled.—The Air Board, Ottawa, Ont. 5 F 3 Flying Boats, 8 Curtis J. N. 4.

### Air Harbour Licenses

Lapsed.—South western quarter, 3 miles N. W. of Saskatoon, Sask; Hampstead, near St. Laurent, Montreal; Bowness Park, near Calgary, Alta.

Cancelled.—River Park, Winnipeg, Man.; Armour Heights, 4 miles north of City of Toronto.

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### CO-OPERATION APPRECIATED

The Canadian Forestry Association appreciates greatly the liberal treatment of its forest protection propaganda by "The Beaver", the excellent and well edited monthly magazine of the Hudson Bay Company. The back page of the February issue was devoted to a message calling for public co-operation for the prevention of forest fires and suggesting that each reader of "The Beaver" enlist as a member in the Canadian Forestry Association.



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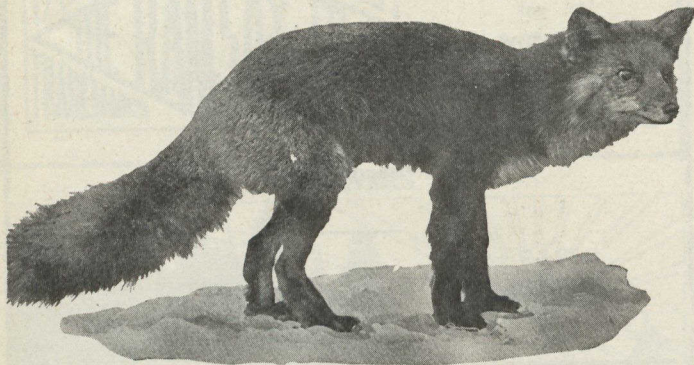
The Spanish River Pulp & Paper Mills, Limited.

## Wild Life in Canada

By W. MacMillan

### RED OR YELLOW FOX *Vulpes fulvus* Renard Rouge

OF THE many types of Foxes scattered through the continent of North America the Red or Yellow Fox is perhaps the most spectacular as well as the most common. The bright yellow fur can be sighted many yards away. During the cold of Winter the pelt brightens



Red or Yellow Fox—A big one of his kind

to a living blaze of color that stands out with startling distinctiveness against the white background of snow. But despite this seeming handicap that Nature has imposed upon him he seems to be well able to take care of himself and according to all accounts is in no great danger of becoming extinct.

The Red Fox is verily a friendly soul and seems to go out of his way sometimes in order to make his home close to civilization. In the open, wind-swept places of his domain he develops a heavy body but gets somewhat paler in color while on the contrary his brother of the wooded sections is smaller but of a more brilliant hue and the fur is softer and silkier in texture.

Hare and Partridge expect to be eaten on sight by this, their swiftest enemy, and they well know that his cunning is hard to circumvent. Should a Farmer have the misfortune to have a Fox anywhere near his farm it is'nt long before wise Reynard gets in his cunning work and the way he avoids traps and snares, set for him, earns him the unstinted praise of all Trappers who pit their skill against his wits.

Attempts have been made to breed the Red Fox and while the breeding has of course been quite successful it has been found that the prodigious appetite of the animal is too great to allow for much profit on the pelt.

The young of the Red Fox average from two to five in a litter and some females have been known to give birth to as many as ten kittens at one time. Being poor diggers the females nose around for some ready-made home in a tree stump or some loose rocks. In Northern Quebec, Indians have been known to dig up litters of young Red Foxes, fill a bag with them and peddle them to City people for a dollar a piece.

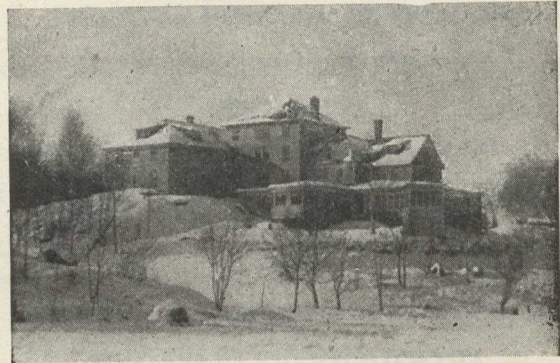
A large male Red measures about twenty-five inches in length and has a heavy brush about twelve to eighteen inches long. The females run smaller. A pelt is worth from Ten to Thirty-five Dollars.

The wonderful dye-holding qualities of the fur is

## Winter in the Laurentians

Canada's national Winter sports—skating, tobogganing, skiing and snow-shoeing—with all their interesting and thrilling variations are nowhere more comfortably or readily attainable than in the confines of the Gray Rocks Inn estate.

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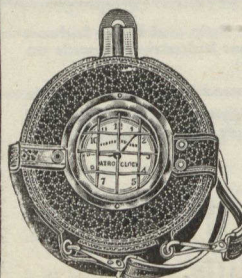
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fully recognized. The pelt is dyed and smoked and pointed till it loses all semblance to its former self and adorns the shoulders and satisfies the whim of fair women under many names. His bright-colored identity is perhaps buried deepest under that type known as Pointed Fox. The skins are first dyed a deep glossy black after which white Badger hairs are securely cemented to the roots of the fur. When carefully done, these white hairs do not come out and it is even claimed by some that being coarser than the Fox fur they help in the durability of the Fox. Be that as it may, the Red fox so created bears a close resemblance to the expensive Silver Black.

From the Peace River in Canada have come in the last few years a few skins of a whitish Red Fox, mingled no doubt in some way with the small White or Arctic Fox.

## How Plantations Grow!

By FRANK J. FRENCH

**C**HATHAM.—Reforestation has never been considered seriously in Kent. Few men care to wait half a century for monetary returns. "We will be gone before they are worth anything," is often the selfish reply when advised to plant trees. Here big crops and speedy returns are expected from the genial climate and fertile soil. Indeed, it is a common occurrence for the farmer to have the money from his bean crops within a hundred days of planting. Still, trees grow while we sleep and even the years have a trick of fleeting away as most of us can testify.

Over 60 years ago Squire Fisher abandoned his log cabin of pioneer days and erected a huge frame mansion and barn on the banks of Paincourt Creek in Chatham Township. He surrounded his dwelling with a large apple orchard, while the front yard was thickly planted to Norway spruce. Although he built and planted so well, fate decreed that another family should inhabit the house and eat the fruits of the orchard.

The spruce grove was left untrimmed and rapidly assumed the appearance of a miniature forest. Under its canopy children played on its needle carpet, while above the robins nested in the Spring. Yet through Summer's heat and Winter's cold the grove kept ever green the memory of its planter.

Recently the barn was burned down. The huge, hewed, oaken timbers and whitewood siding cannot be replaced. In casting about for timber the owner thought of the spruce grove and engaged a carpenter to look it over. They are cutting the trees. Sticks measuring over two feet across the stump are common. When felled some measure 70 feet in length. The owner values the acre of timber at \$1,000.

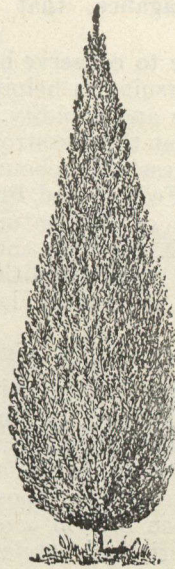
Reforestation is practicable in Kent, but I would not advise the planting of spruce. We have many more valuable and faster growing trees.

Neighbors will regret the passing of such a picturesque landmark, but it is some consolation that the good old squire did not plant in vain.

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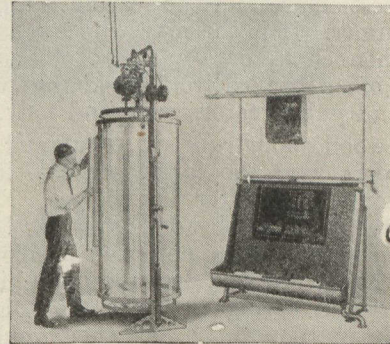
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## Criminal Waste

(An Editorial in the Montreal Star)

CANADA is wasting one of her richest natural resources with a prodigal extravagance that is criminal.

Canada is not only taking no trouble to conserve her timber wealth, but the policy she is pursuing is helping to deplete her forests with thoroughness and rapidity.

It is not on the present generation that the disastrous effects of her neglect and short-sightedness will rebound but on the citizens of the future. The Federal and Provincial Governments, who are trustees of the natural resources of the Dominion, are selfishly wasting their substance without any regard for their responsibilities, without appreciation of the trust that is morally laid upon them.

In a striking letter on this page Mr. Frank J. D. Banjum submits a few of the main heads under which our forest riches are being wasted. He points out that insects which attack our trees destroy one billion feet of merchantable spruce. The pulp and paper companies are denuding our forests and the toll of the axe for all purposes amounts to an annual shrinkage of fifteen million acres, while the loss by fire—largely due to criminal carelessness and inefficient patrolling—amounts to several million acres more.

Canada is cutting and burning her merchantable lumber just as if her citizens were a handful of settlers set down in the midst of a wide-reaching and seemingly limitless virgin forest. The limit holder and the land owner are not the chief sufferers from the policy of negligence and indifference that is being pursued. Perhaps if they were we should have pressure brought to bear upon the Government to put a stop to this national tragedy. As the visible supply shrinks, the price of lumber and pulp, reacting to the changeless law of supply and demand, goes higher and the increase is passed on from the concessionaire and the leasing company to the ultimate consumer. It is the man who buys the wooden box, the kitchen chair, or any one of the innumerable articles made of or derived from wood that will have to pay the price of public carelessness and folly.

"There is wood enough for us to cut and burn," say the limit holders, and the forest owners—let the generations to come look after themselves. What crass ignorance. What wrong-headed stupidity! Such an attitude is reminiscent of the notorious pacifist statesman who boasted that if war was declared upon his country a million men would spring to arms over night. They would have the spirit perhaps, but they would not have the arms, the equipment or the training. So the generations to come who find timber scarce and the cost of cutting high owing to its inaccessibility, may have the will and the urge to cut more, but they will not have the raw material.

Armies do not spring up full statured over night, forests do not lift themselves from seedlings to great trees at a magic touch. Nature builds perfectly but slowly and not all the wishes or even the necessities in the world can in an instant add a cubit to the stature of a forest sapling.

It is high time that Governments ended this period of criminal lethargy and bestirred themselves to the adoption of a policy of reforestation, of planting and of protection.

Much of the damage that has been done is irreparable, but with the facts clearly before us we shall deserve, and receive in full measure, the censure of the generations of Canadians yet to come if we delay any longer in staving off a national calamity while there is yet time.

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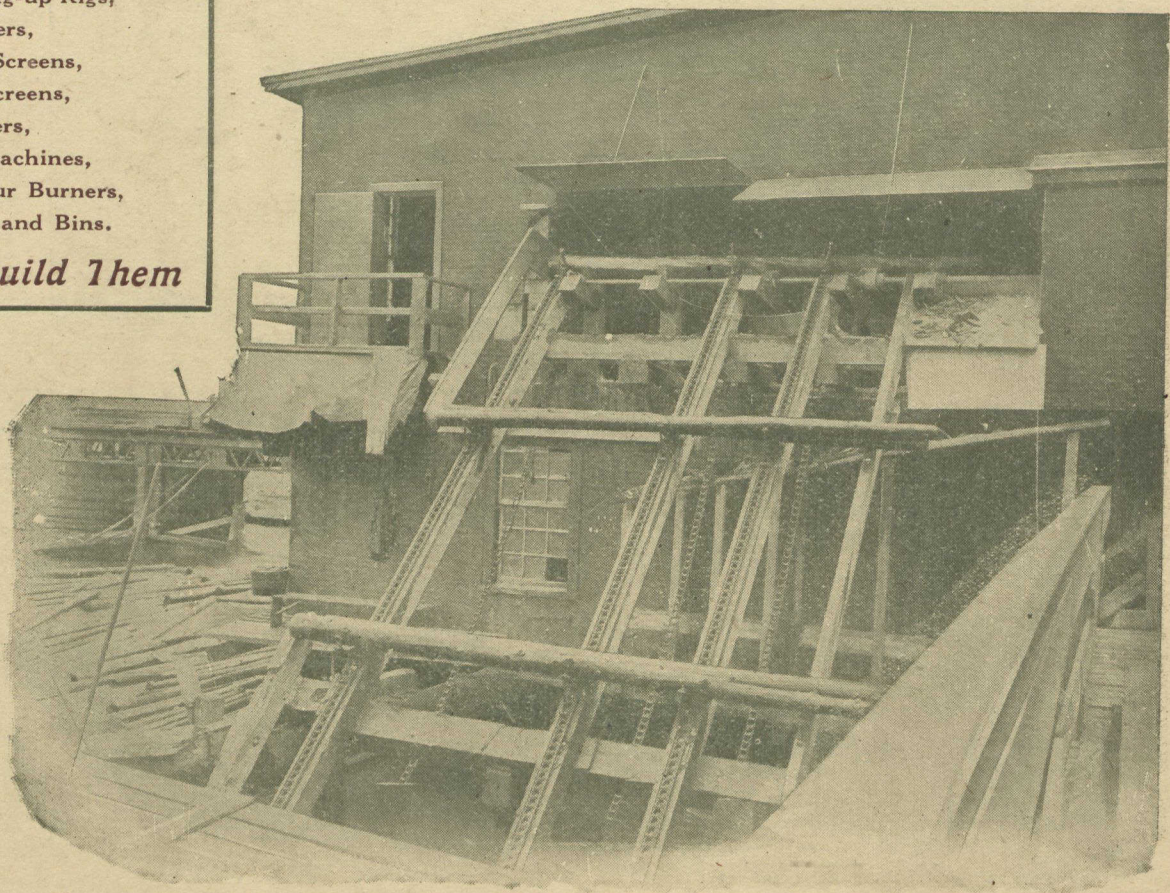
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