

Canadian Forestry Journal

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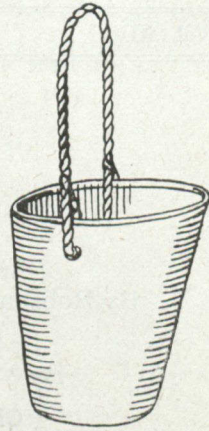
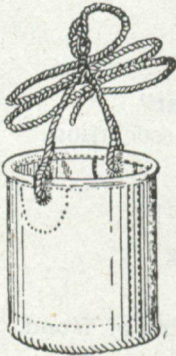
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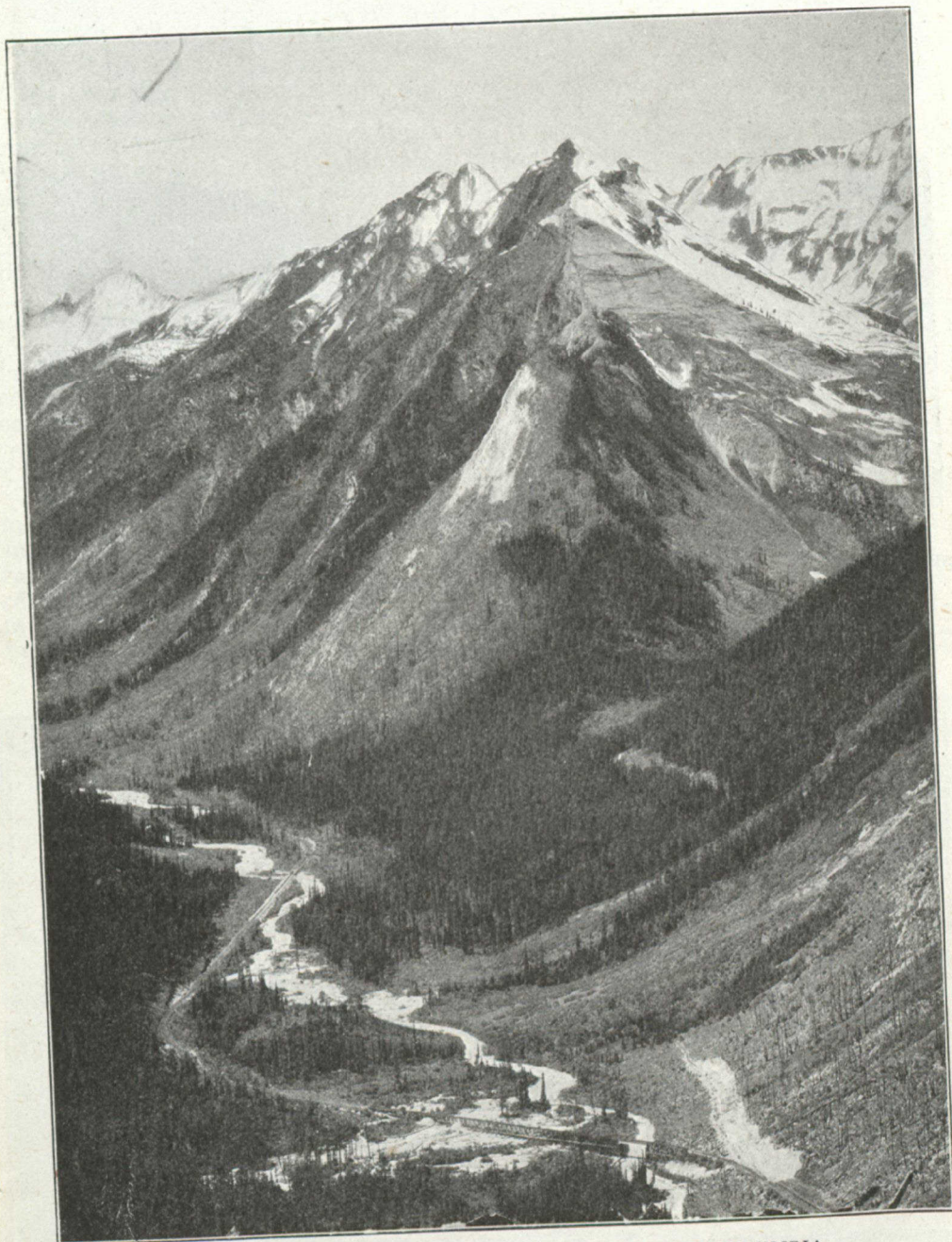
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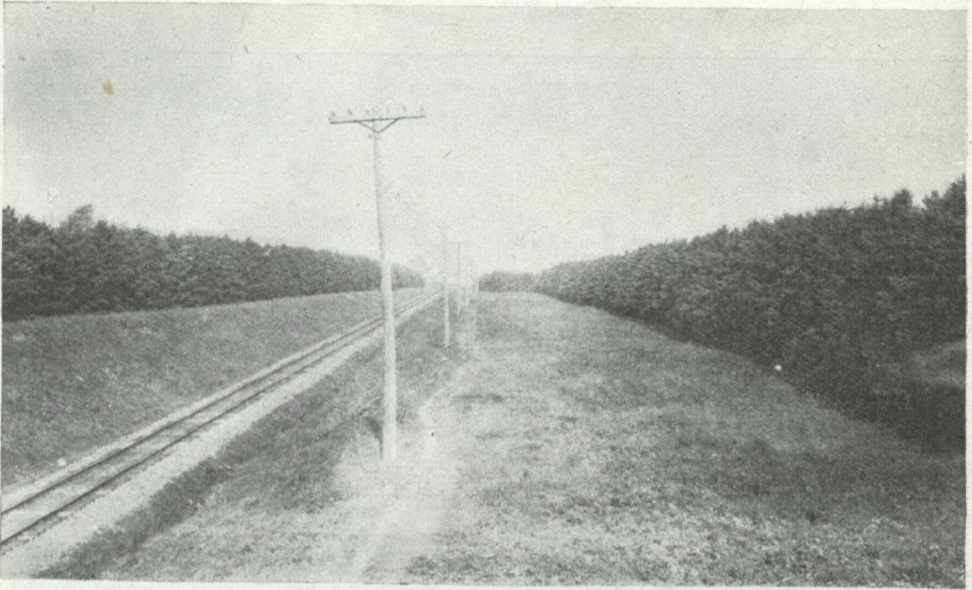
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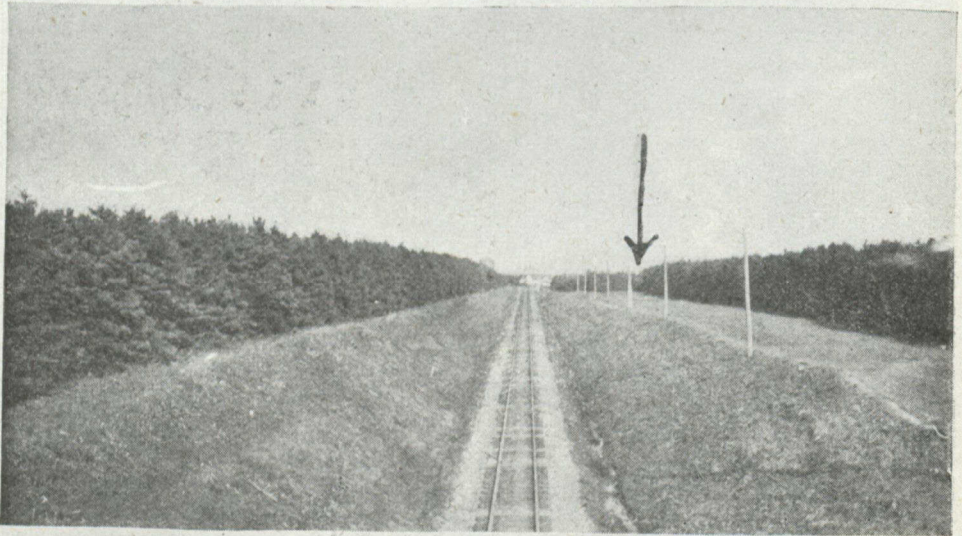
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LOOKING ACROSS ILLECILLEWAET VALLEY, BRITISH COLUMBIA



Pictures by Courtesy C. G. R. Magazine
Showing the good work of the Canadian Government Railways in planting spruce hedges between
Campbellton and Bathurst, New Brunswick



A snow hedge with end (shown at arrow) returned at right angles to prevent the snow from drifting
into the cut

Money in the Maple Bush

BY THE EDITOR

It has often been said that the forest represents more services to human kind than almost any other national possession. To the minds of the majority, lumber and pulp wood are the sole associations of a productive forest. The wider one's observation becomes, the more clearly it is seen that lumber and pulp wood are just two of the thousand-and-one dividends paid by a timberland, albeit, they produce more profits to the country than other forest activities combined.

55,000 in the Sugar Trade

Although most Canadians are to a moderate extent consumers of maple sugar and its products, it is seldom realized what a valuable source of revenue lies in this annual use of maple woods. The Dominion has today 55,000 sugar-making plants

and in 1916 produced 19,600,000 pounds of maple sugar, worth about \$1,500,000. Quebec alone has more than 35,000 sugar making plants, 20,000 others being shared by Ontario and New Brunswick. Only in recent years has the plan of co-operative effort come to the rescue of this most important industry and today such an organization as the Pure Maple Sugar and Syrup Co-operative Agricultural Association in Quebec, is doing most valuable educational work, which with the aid of other co-operative bodies, ought to be able to double or treble the income derived by farmers through maple sugar manufacture. Mr. J. H. Grimm, the well known Montreal manufacturer, stated recently that if the waste of sap could be saved and the quality improved, the farmers of Eastern Canada might just as well secure



BOILING DOWN THE SAP IN A MODERN QUEBEC SUGAR CAMP

\$4,000,000 a year, and if all the trees were tapped this amount could be easily doubled.

Adulteration Discouraged

Since the Dominion Government gave protection against the plague of adulteration which was undermining the market at home and abroad, the entire business has been placed upon a new footing. The market is growing rapidly, not only in Canada, but in the United States and Great Britain, New Zealand, South Africa, Australia and Newfoundland. Last year, an order for one-hundred thousand pounds came from Lyons, France. Another order for 25,000 one-pound cakes was received from Chicago. From 70 to 100 car loads are sent every season to the United States. Mr. Gustave Boyer, President of the Co-operative Agricultural Association said recently that the enforcement of the law protecting the making of good sugar was having a marked effect. Last year out of 209 samples, 162 were found pure.

Indian Methods

The manufacture of maple sugar in Canada began with the Indian tribes. On the approach of Spring the Indian tapped his trees aslant with a tomahawk and inserted above this opening a chip of wood or pipe from which the sap fell drop by drop into a birch bark receptacle. The sap was then boiled in earthenware vessels. In this way they obtained a small quantity of thick black syrup, the only sugar used by the Indians.

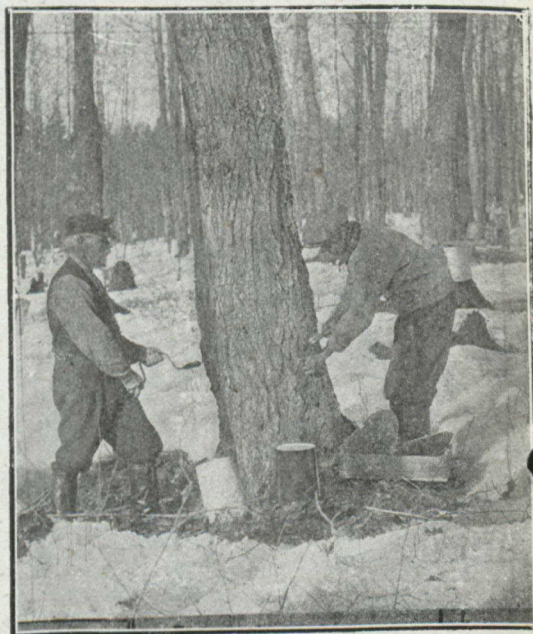
The industry has not made the progress that might have been anticipated. In 1860 the Eastern Canadian farmers made 13,000,000 pounds of sugar, two-thirds as much as was made in 1910. They secured these earlier results with very crude equipment and lack of markets. As time went on the unfair and dishonest competition of adulterators almost forced the industry to the point of ruin.

It is estimated that scarcely one-quarter of the valuable maple trees of Canada are being tapped each

season. According to the Quebec producers, to justify any adventure into the maple sugar business, from 700 to 1000 maple trees should be tapped. This necessitates employing two men. With 1,000 cans, from 1500 to 2,000 pounds of sugar can usually be made, taking into account the average yield every season. Mr. J. H. Lefebvre, Secretary of the Co-operative Agricultural Association, has made 1300 pounds with 400 cans. "If the yield is 2,000 pounds," says Mr. Lefebvre, "keep 400 pounds for your own use, leaving you 1600 pounds, worth from 10 to 14 cents. Even at 12 cents a pound the returns amount to \$192. These sugar camps, when properly worked, pay very well. It requires only a few days work at a time of the year when nothing else is being done."

\$30 an Acre

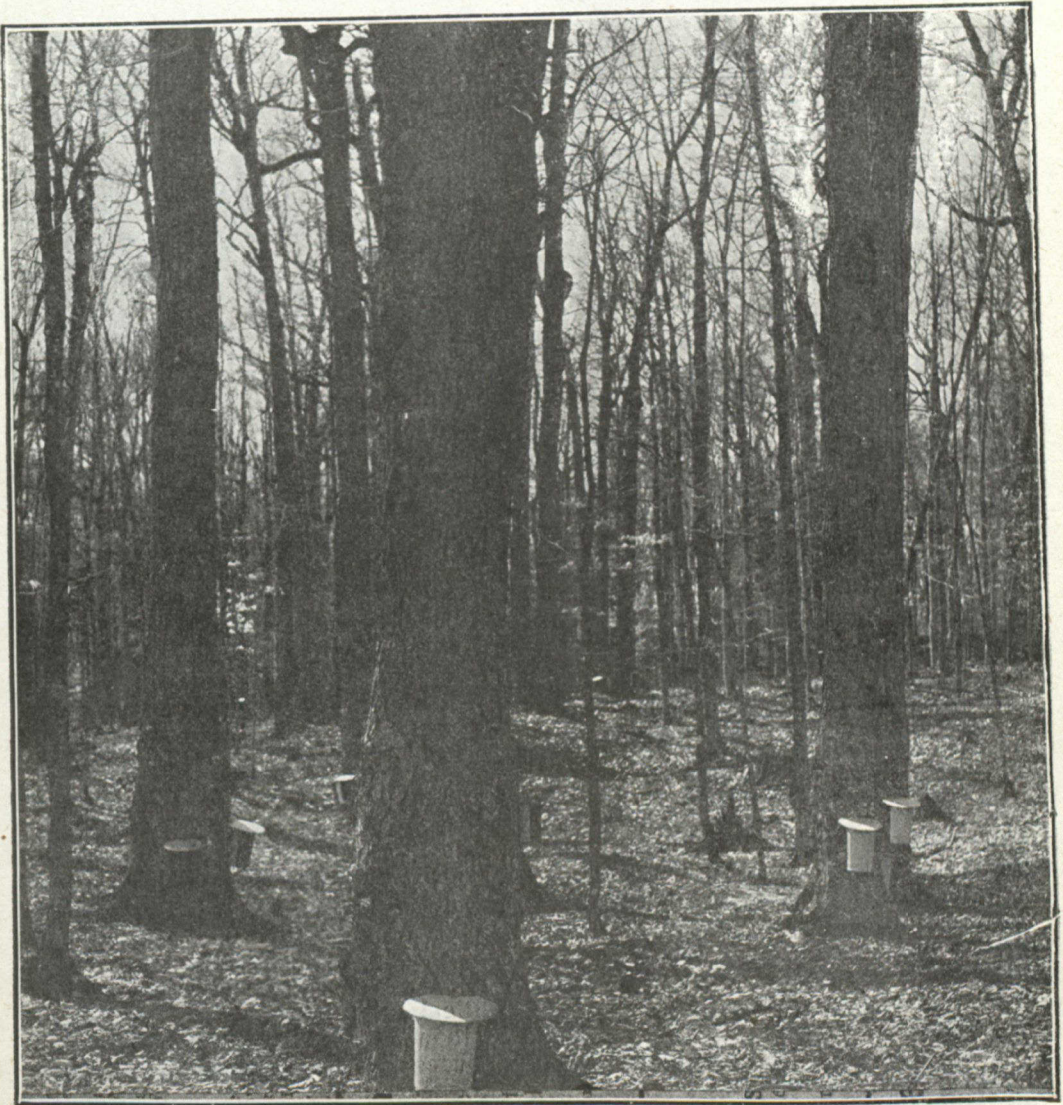
If a high quality of sugar and syrup are made, 100 trees per acre, with an average of 2 pounds of sugar per load selling at 15 cents a pound, the results would be an income of \$30 per acre on practically waste land, giving the farmer good returns for his labor.



STARTING THE SAP FLOW

It has been estimated that about 9 per cent. of the sugar contents of a maple tree is obtained from a single tap. At the same time experts are of the opinion that if 20 per cent. could be obtained no damage would be done to the tree. A general rule for the

guidance of maple sugar producers is that a tree capable of producing half a cord of wood should be tapped only in one place, while one from which a whole cord could be obtained may be tapped in two places.—R. B.



A QUEBEC MAPLE BUSH DURING THE SUGAR MAKING SEASON

The Forests of Canada in Peace and War

BY ROBSON BLACK

Secretary, The Canadian Forestry Association, Ottawa

The Vital Relation of the Dominion's Forests to the Future Safety of the British Empire!

LOOK a moment at the map on the opposite page! Notice that strip of solid black across Canada! It is the British Empire's chief forest resource, the only coniferous timber supply along the All-Red Route.

Australia and New Zealand, although once well forested have wrecked their great inheritance through fires and ruthless operations. South Africa has to import its big timber from outside. Parts of India, notably Burma, are rich in hard wood supplies but the selling price alone would make their general use prohibitive.

John Bull, in peace time, places a tremendous drain on the world's forests. He requires 600 million cubic feet to keep him going a year. Only one log out of eight used is grown in the British Isles. The balance he brought from Russia, Scandinavia, and America. His cheque for Canadian lumber and square timber is about \$14,000,000 a year.

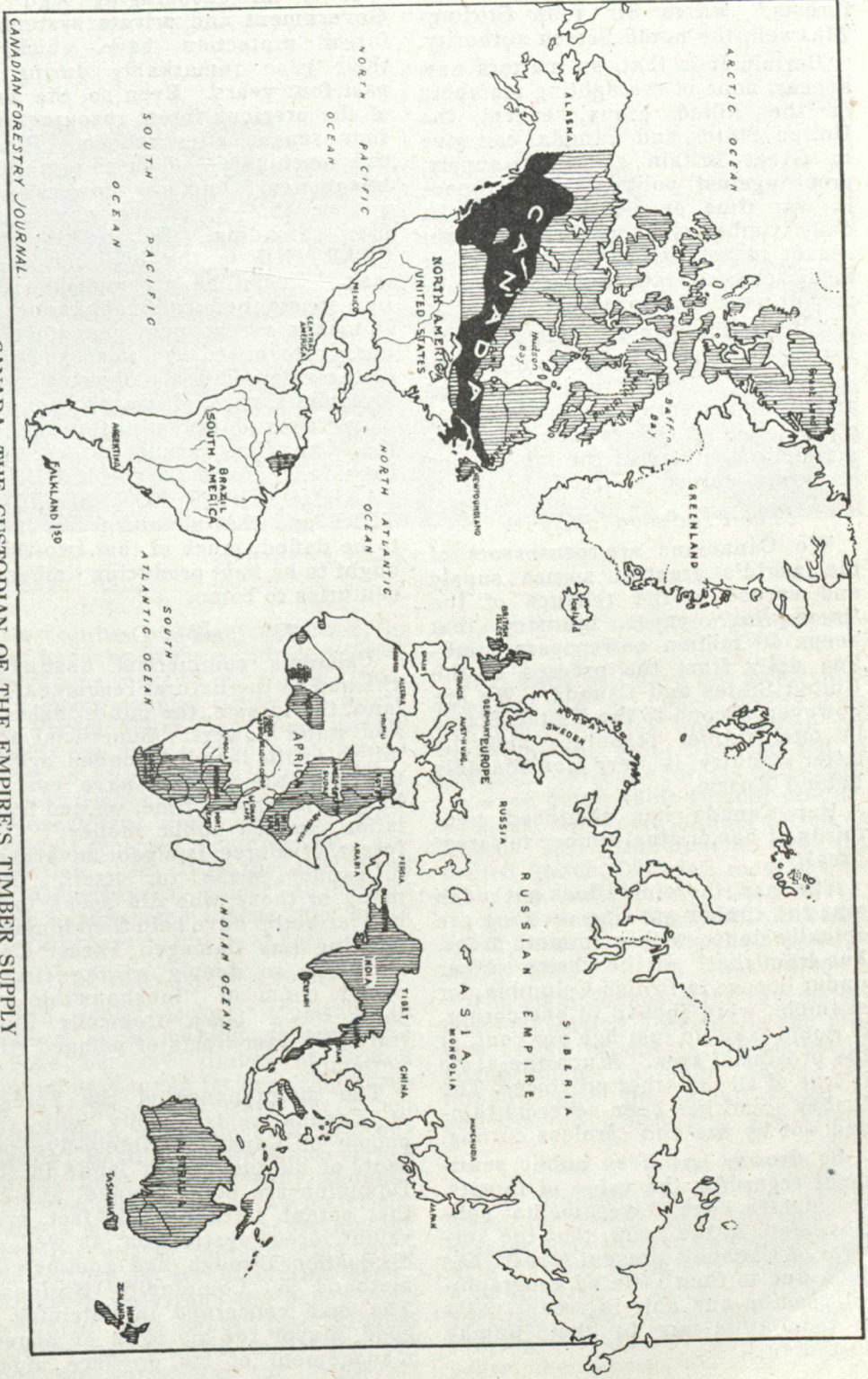
John Bull in time of war found the problem of getting timber supplies as great a source of worry as his shell output. Ships could not be spared for transporting such bulky cargoes across the Atlantic, or even the North Sea. Premier Lloyd George repeatedly expressed anxiety over the maintenance of timber supplies, for during the first two years of the war more ships were used for timber than for any other import. "The situation," said the Premier, "calls for the gravest uneasiness." The employment of Forestry Battalions in the British Isles relieved the situation substantially, although that drastic course has almost under-

mined the foundations of Britain's mature timber stands. Little, if any, British timber is sent to France because of pressing requirements at home. The forests of France, so splendidly planned a century ago, and jealously guarded from fire and reckless exploiters, are able to furnish the fighting front with 200 million feet of timber each month and to keep British coal mines supplied with pit props as well. Nearly 30,000 French trees are falling every day in order to hold back the German legions. Without rich forests, France probably could not have offered successful resistance a single month, nor in such case could any of the Allies have risked offensive action.

When the War Ends, What?

With home forests depleted far below the inadequate level of pre-war days, Great Britain is even now preparing for a great reforestation enterprise. But that means a long waiting period for mature timber. France will have little to sell abroad. Belgium's forests have already paid the invader's price. Italy's forests are inconsequential.

Britain, therefore, will be forced to turn again to her old sources of timber supply and those sources are in the main, Russia, Norway, Sweden. What the fates hold for Russia's political organization none may say; as to what control of the natural resources and export trade the German marauders may impose, only the present dangerous developments in the Baltic offer any clue. "Should Russia, on which we have latterly been mainly dependent, now enter on a period of development, she will soon, like the United States, herself



CANADIAN FORESTRY JOURNAL
CANADA, THE CUSTODIAN OF THE EMPIRE'S TIMBER SUPPLY

absorb the whole produce of her forests," writes Sir John Stirling-Maxwell, the noted Scotch authority.

Certain it is that, as matters now appear, none of the fighting members of the Allied group, except the United States and Canada, can give to Great Britain a timber supply, proof against political interferences in war time or peace. Without a daily timber supply, Great Britain ceases to be a world factor, whether in agriculture, manufacture or military or naval enterprise.

Look at the map once more!

In a spirit of entire friendliness to our United States rivals in forest production, it surely behooves Canadians to plan NOW to take full commercial advantage of the inheritance of natural forests.

The Printer and the Tree

We Canadians are possessors of the world's greatest spruce supply and spruce is the reliance of the "newsprint" paper industry that keeps 40 million newspapers tumbling daily from the presses of the United States and Canada. We are however, second to the United States in total timber resources and the latter country is very considerably behind Russia.

But Canada has sacrificed two-thirds of her original timber to forest fires!

The map, therefore, does not mean that the timber-growing sections are actually dense with mammoth trees. Far from that! If the choice timber under license in British Columbia, for example, were shoved to one corner, it would take up just five per cent. of the provincial area. Much the same is true of all the other provinces. The timber stand has been severely thinned out by fire and careless cutting.

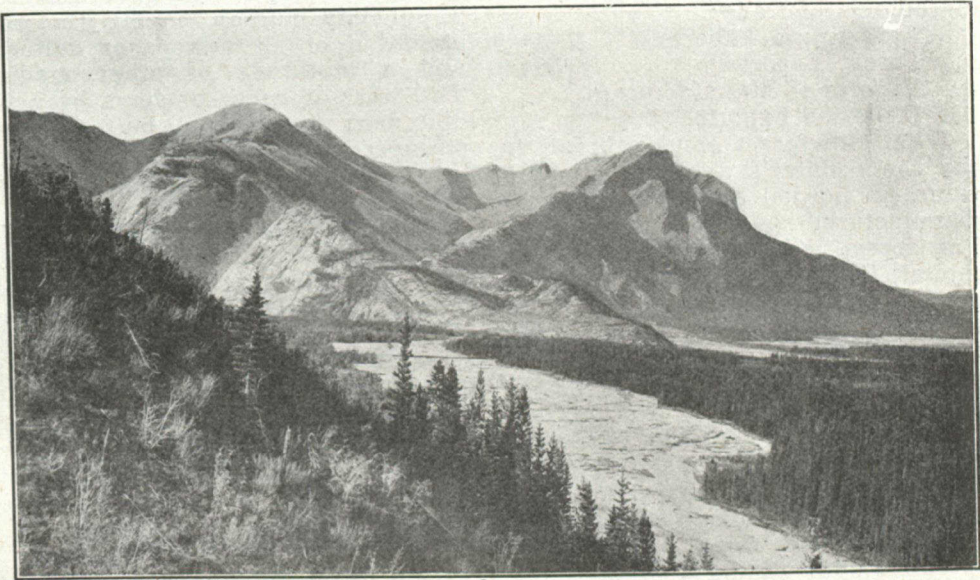
So drowsy has been public sentiment regarding the value of forests, so sluggish have Governmental policies been, in the main, that the survival of Canada's present forests has been due to their isolated geographical position and only in recent years to thoughtful care by their human custodians.

It is an encouraging sign that Government and private systems of forest protection have quickened their pace remarkably during the past four years. Even so, the waste of the precious forest resources persists season after season. Protective machinery—such as patrolmen, telephones, lookout towers, fire pumps; etc.—go a long way to stop fires spreading. But to stop fires STARTING is the big end of the task. It can be accomplished only by a constant educational hammering. It means a reasoned, persistent endeavor to abate the misconceptions of the splendid national value of the forest industries. It means a country-wide "show down" of facts to induce the Canadian people to see that Providence made TWO-THIRDS OF CANADA UNFIT FOR AGRICULTURE and that if natural law is not to be defied, much of that two-thirds ought to be kept producing timber for centuries to come.

The Road of Destiny

Canada's commercial destiny is chained to the natural resources; the land, the forests, the mines, fisheries and water powers. Superficial activities, (with the dice loaded against us from the outset) have cost us heavily in wasted time, wasted legislation, wasted public money. The forest, of course, is a poor advertiser; it cannot speak for itself. And many of those who did speak for it had far better have held their tongues. Nothing has damaged Forest Conservation so deeply as the circus-poster claim of "inexhaustible resources"—a boast ironically illustrated by vast tracts of pillaged timberlands.

The maintenance of the Forests of Canada rests wholly with the people of Canada. Ninety-five per cent. of all the timber lands in the Dominion are public owned, and by that potent, unchangeable fact, prevalent forest destruction, as well as dissipation through bad commercial methods is Community Business. The man concerned in obtaining a good Mayor for his town or honest management of his province must,



ATHABASCA VALLEY, JASPER PARK, B. C.

perforce, be equally concerned in what happens to the nation's greatest inheritance, next to our fertile lands.

In every country on earth, where the Forest Piller has been undermined, the people have been forced either to buy back an equivalent of the lost timber from foreign lands at an exorbitant cost, or they have meekly accepted commercial annihilation. In 1914-15, the British Government paid \$40,000,000 more for imported timber than home grown timber would have cost.

The Wherefore of Profits?

Still richly stocked, especially in eastern paper-making spruces and in the big saw timber of British Columbia, Canada faces an opportunity to take profits from her forest possessions unmatched in previous history. Eastern United States spruce forests have been heavily reduced and upon that failure of raw materials, Canada has reared a paper-making industry selling abroad this year \$35,000,000 of manufactured paper. (Eighteen years ago the paper sales to Uncle Sam were just \$122.00. Figures may not look impressive, but they are sometimes the synonyms

for a thriving and contented population.

If Canada can keep her forests unimpaired she will collect profits from the United States and Europe far exceeding the great financial toll of the past. With the forests destroyed, (or even below their present productiveness) we would blindly forfeit to Russia and Scandinavia and the United States, Canada's most powerful claim (outside of farm produce) for world trade. We would surrender out of sheer prodigality the only large timber supply in the British Empire.

The maintenance of the raw materials—the Living Forests—is the precise gauge of our future industrial advancement in pulp, paper and lumber, and the great range of activities to which they contribute.

What of Foreign Trade?

The deterioration of the living forest, by fire and otherwise, is at the present time the **GREATEST MENACE TO CANADA'S INDUSTRIAL EXPANSION AND EXPORT TRADE**. When munitions exports evaporate with the declaration of peace, the nation's financial position

abroad will rest upon certain main ingredients of trade:

- Agricultural Exports.
- Forest Exports.
- Exports of Manufacturers.
- Fisheries Exports.

What the forest sends abroad to pay the country's debts is equal in value (in normal times) to all other manufactured goods put together. The forest industries contain more capital, fill more pay envelopes, and employ more men than any other in the Dominion. This thing is big enough to be worth saving.

Partners in a Public Cause

The Canadian Forestry Association is a national society of 6,500 members, without identification with governments or commercial concerns. These men form what is really a co-operative body aiming to promote the cause of better forest management. Their point of view is wholesomely patriotic and national. Only a small percentage of the members own even a stick of timber. Neither are they sentimentalists about Tree saving; their outlook is mainly economic.

They are working by the swiftest route—Education—to stop needless waste of the easiest-won legacy Canada will ever lay her hands on. They aim to drive out forest fires, which are the product of the human "I don't care." They aim to so improve the forests as to maintain hundreds more wood-using industries, employing thousands more men, and pouring new wealth through all the avenues of commerce. They aim to conserve not "trees" but the national advantages that huge timberlands bestow.

The Way of Working

This co-operative society has a permanent secretary and staff, with officers in the Booth Building, Ottawa. There is conducted a widely diversified educational campaign, reaching tens of thousands of school children, teachers, clergymen, settlers, railroad men, sportsmen, etc., through scores of annual illustrated lectures, motion pictures, magazines, propagandist literature in large editions,

special campaigns with governments, a publicity bureau having the co-operation of all newspaper editors, and a multitude of other media. The working methods have brought abundant results in better laws, stronger administration and a growing body of vigilant and informed public sentiment.

The NATIONAL CONSEQUENCES of these continuous propagandist enterprises are recognized and praised by public leaders and business men everywhere. The work is imperatively needed in these days when preparations are being made to equip our nation for the future struggle, and to adapt our special advantages to the fuller service of the Allied nations.

Look the Map Over Again

That strip of forest belongs to Canada. But it is also a vital sinew of the Empire, whether in peace or war. With its protection and perpetuation assured, Canadians may confidently proceed towards a great commercial development. Forest industries, like agriculture, are in the direct path of Canadian expansion.

41 DAILIES IN ONE CITY

Buenos Aires has forty-one daily newspapers, which consume 30,000 tons of news print a year, according to Robert S. Barrett, a special agent of the United States Bureau of Foreign and Domestic Commerce.

GERMANY'S PAPER DECLINE

In 1913 Germany's paper exports amounted to approximately \$60,000,000.00, while 200,000 tons of pulp was exported. The United Kingdom took 36,000 tons of the 95,000 tons of wrapping paper exported, 18,000 tons of the 77,000 tons of printing paper exported, and 3,700 tons of the 16,000 tons of cardboard exported.

Print paper costs five times as much today in France as it did before the war, and is hard to get at any price. That is the explanation the press gives the public for the increase in price of 1-cent papers to 2 cents a copy

High Prices Make Farm Forestry Possible

What an occasion the present offers for an energetic thoroughly-organized and persistent educational campaign among the farmers of Ontario, Quebec and New Brunswick for the intelligent managing of their woodlots!

Except for a commencement by the Quebec Forest Service, nothing has yet been done, although an opportunity such as now exists may be some years in developing again. The farmer's woodlot has soared in market value. No longer is cordwood being cut and delivered at three dollars a cord. No longer does the farmer count his stumpage as worth nothing and his time and horses as the only elements figuring in the selling price. That day is gone for ever. The present, however, is probably the peak period of high prices unless the

labor situation gets more stringent. The farmer is willing to be told how to manage his woodlot so as to extract the highest profit and maintain its capacity for future profits. It is surely a great sowing period, in which the provincial forest departments are obviously, the educational leaders.

Hitherto, the farmer has not found it worth while to take from his woodland the poorer slow-growing species, the crooked, hollow, dead-topped trees, and windfalls, because no market existed. So the average woodlot remained cumbered with debris, with young growth restricted, and undesirable species taking up the room. The market will gladly pay the farmer in settled districts for taking out this material and by the same stroke he will give the more valuable species a new lease of life.

How to Cut a Woodlot

The following excellent hints for cutting in a woodlot were prepared by J. S. Holmes, State Forester of North Carolina.

1. Cut clear only where it is intended to clean up and use the land for agriculture. In such places close utilization is the only conservation measure. Use up closely all tops, dead and down trees, knotty or hollow logs.

2. Burn brush only in damp weather so that fire will not spread. Do not burn the leaves off the ground, but leave them to furnish plant food and humus to the soil.

3. In arranging a contract for cutting specify clearly what trees are to be cut and what left. Do not leave it to the contractor to decide this. Do not cut a tree just because it will split up easily or can be worked up quickly. Use up first all material which is not saleable for any other purpose.

4. Leave the young, thrifty trees of the best species to grow into valuable

timber. Leave merchantable saw timber for cutting into lumber when needed. Leave all young growth for the future crop.

5. Save from two to six trees per acre of the more desirable species for seed trees. Seed trees should be healthy specimens with good large tops, reaching above the surrounding trees if possible. Do not select worthless trees, but rather ones that are now merchantable and that will be just as valuable or still more so in ten years time, when they have sufficiently seeded up the area.

6. Cut all dying trees and all dead trees, standing or down, if sound enough for fuel. This not only utilizes waste material but removes a great risk from insects and fire.

7. Cut all up tops and defective and broken logs, after logging, all lodged trees and broken small trees, and all timber used in skidways and other logging operations.

8. Cut suppressed, dead-topped,

crooked, forked, knotty, hollow and punky trees.

9. Cut all mature or over-mature trees which have been left as un-merchantable, except good seed trees.

10. Cut trees of the poorer species which are not worth more for some other purpose.

11. Cut wolf trees—those large, spreading, over-mature trees of good

and poor species which are occupying more than their proper share of the ground and will not make profitable timber trees. Sometimes wolf trees must be left for seed, but if good timber trees are present, they should be preferred for seed trees and the wolf trees cut.

12. Keep fire out of the woods absolutely.

Know These Facts About Cordwood

One standard cord of well-seasoned hickory, oak, beech, birch hard maple, ash, elm, is approximately equal to one ton, 2000 pounds, of anthracite coal.

It takes a cord and a half of hemlock and soft maple and two cords of cedar, poplar, spruce, white pine, or basswood, to give the same amount of heat.

One cord of mixed wood, well seasoned, equals in heating value at least one ton (2000 pounds) of average grade bituminous coal.

A good many people purchase their fuel wood without considering any feature but the price. On that basis, a man who phones for a "load of body wood" at \$12 a cord may really be getting half the value of his neighbor who personally sees that he secures 128 cubic feet of beech, hard maple, ash, birch and elm, well seasoned.

Some wood has been delivered in Ontario cities this winter which, considering its greenness and bad quality, was costing the owner about three times as much as anthracite coal.

A Community Wood-Chopping Day

By Kenneth B. Welles in the "Outlook."

Winter has lost its worst shiver for Old Lyme. We have ceased to shudder even if the Government should commandeer the next; and the next, and the next coal barge as it did the last. We gave winter the warm shoulder last Thursday when we had our first Community Wood-Chopping Day.

It came about this way. A few fortunate people had coal in their bins and woodpiles by the back door, but the rest of us realized that it was either freeze or "hustle." Coal was ordered, had been since last April, so the two dealers assured us; but five hundred miles turns coal into a pretty cold proposition. Then we sought the old reliable woodmen. Surely they would not fail us—they never had. But one was icing, one was tired of hauling wood, one had moved into

New London, and one had a few cords of promises. Then we put our heads together.

The railway station, where behind his wire grating sits Tommy Haynes, agent and First Selectman of Old Lyme, has been the birthplace of more than one brilliant community idea. There we went.

Tommy was really serious. He cursed the cold. He told how empty his bin was. Then Fred Babcock, our journalist, told how many times he hadn't got wood. We were all agreed on one thing: Lyme, even though for two summers, the residence of the President, was left out in the cold, and was likely to stay so.

Routing out Citizens

Then the idea came. Why not have a community wood-chopping

day? We have had community everything else, why not invite all the men to a big bee, and cut enough wood to make the town snug for a time? The woods were at hand. If no one else would do it for us, why not go our selves? We had visions of town chopping days all over the State. Then it would sweep through New England, carry the whole country, and, presto-chango! the National problem of fuel would be solved.

Tommy appointed a whole harness of committees, enough to hold the best town that ever put its neck under the yoke of community effort. He had an enrollment committee to rout out the citizens, a transportation committee, a coffee committee, a publicity committee, an ax-grinding committee, and a general oversight committee.

Lighting the Fuse

Fred Babcock put the first notice in the paper something like this:

Mr. Haynes states that he is confident he can cut as much wood in a given time as Captain Huntington, and Frank L. Saunders is willing to put up a small side bet that he can outcut Constable James F. Bugbee, John Hoskins is willing to try conclusions with Dr. E. K. Devitt, and George Babcock is confident he can cut more wood than Nat. Sheffield. John Sterling, while a little out of practice, is willing to have his pile measured against Captain Voorhees' and Griswold Perkins thinks he can measure up a bigger pile than the Rev. K. B. Welles, and so it goes.

That fetched them all right. George Babcock, the plumber, really did say, "I'll be darned if they can cut more wood than me." When you walked up the street, the men would say, "Well, got your ax sharpened?" "Hey, where's your ax?" Andrew McGaw, the all-around man, set up a grindstone in the library cellar. It travelled about five hundred miles the first day.

Then a fine pair of boots were seen hanging in Bugbee's store—the prize for the fellow who cut the most wood. That was the finishing touch. It lined up all the old regulars, so that when the enrollment committee, for

form's sake, asked the fellows who only come to town on election day, to every one's surprise, they "allowed" they would be present. Fifteen "huskies" from South Lyme calculated to come up to get those boots.

Starting for the Woods

The selectmen were to pay \$1 a cord for the standing timber and \$2.50 a cord to the men for chopping. They would have it hauled and would sell it to any citizen at just what was paid plus the cartage. The wood should all belong to the town. It was to be a genuine community enterprise.

Then came the day, cold and clear—ideal for chopping. An early start seemed easy that morning. We met at the town hall, like a lot of kids out for a picnic. There were Clark Voorhees, the landscape painter, and Jack Noyes, the house painter; there were the Hon. Joseph Huntington and Bob Appleby, farmer, father of two boys in the service. The minister, the store-keeper, the plumber, the carpenter, the woodman, and Tommy Haynes all were there. It was a town holiday. The stores even had closed to be in the swim.

We got in the woods at Stone House Ledge with shouts of glee, and then the fun began. What music it was to hear the play of axes through the trees! An English cock pheasant, frightened by such unwonted activity, flew over the heads of the line of workers. We shouted and lifted a little prayer of thankfulness that we were alive in the beauty of that morning and sharing in the fellowship and service of the day.

It is marvelous how fast the morning passed, and how happily. Tommy Haynes, accompanied by the State Fuel Commissioner's representative, urged us on to more heroic efforts.

Then came twelve o'clock, and summonses from the cooks. There never was such coffee, we are sure of that. A wash-boiler full, and milk and sugar!

Mixed Company

There we all lay on the ground eating our victuals. Chris Anderson,

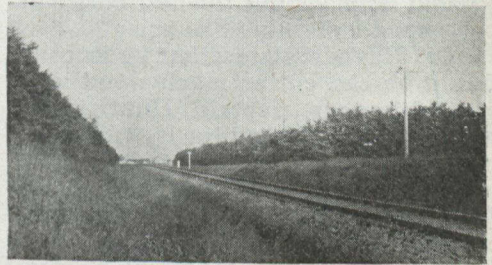
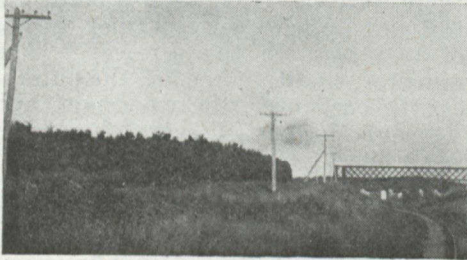
the farmer from South Lyme, never knew before what a good fellow an artist is apt to be. The artists never imagined before that there are knack and genius in the woodman. We chaffed each other, liked each other, and reveled in the company. We luxuriated around the fire, all except a few whose axes we could still hear ringing in the distance.

Then we went back to our work again to finish up our cords to bear the inspection sticks of the judges, Sam Tooker and Charlie Tompkins. When at three o'clock they told my partner, "That's a good full cord, with some over for good measure," our hearts swelled with pride, and we patted the pile with the fondness of fathers. Oh, what wood it was—hard yellow

oak, thick and solid and sound! There never was such wood, there never was such a dinner, there never were such a crowd of good fellows, there never was such a wonderful idea! We were "it"!

A Word for Greenhorns

It is not true that greenhorns can't cut wood. We did. It's false that "you will cut your blooming legs off." We didn't. It is nonsense that we are at the coal situation's mercy. We aren't—not altogether. We believe we have taken the crimp out of winter. We have our wood. We had our fellowship. We had our fun. We are going to try it again. We are trying to be a self-dependent little community. And we will—because we have a great community spirit.



A snow hedge of spruces protecting curved track in a cut on C. G. R. in New Brunswick

Where is the Fuel for Next Winter?

"Foresight is always more effective than hindsight, but in handling the coal situation a combination of both is better than either alone," says a bulletin of the Commission of Conservation. The growing scarcity of fuel during the past few years culminated in a near catastrophe during the present winter. It has surely been demonstrated beyond peradventure that it is very dangerous to try "to muddle through" any longer. The experience of the past, has not been lost if that lesson has been thoroughly learned. Indications are not lacking, by any means, that the

shortage of coal next winter will be more acute than ever. The output of the Nova Scotia coal mines has declined from 7,263,485 tons in 1913 to 5,657,000 tons in 1917, or 22.75 per cent. Owing to the steadily growing scarcity of mine labour and to recent serious mine accidents it is evident that there must be a further marked reduction in 1918. At the same time, there has been a large increase in the consumption of coal in the Maritime provinces during those years. In fact, it appears as if the Nova Scotia mines will not be able

to do better than to supply their own requirements and those of the Maritime provinces. If this is done, little or no coal will be available for Montreal and it is assumed that no

Nova Scotia coal will be available for Ontario. Foresight indicates that in the woodpile lies one of the means of preventing panic and disaster next winter.

Flying Patrol for Forest Protection

BY MAJOR K. E. KENNEDY, ROYAL FLYING CORPS

In an Address before Quebec Forest Protective Association, Montreal.

(Concluded from February Issue.)

A few minutes ago I spoke of dodging "Archie," and perhaps some of you wondered just who my friend Archie happens to be. Archie is an anti-aircraft gun, usually well-concealed, and he has a nasty disposition, always trying to keep our fellows from having any fun. I don't know exactly how he came to be called "Archie," but the tradition is that one of our fellows was up one day, and he saw a flash from down below and dodged just in time. What he said was: "Not so, Archibald!" Ever since then those particular guns have been named "Archie." It is considered quite the thing to go up and dodge Archie—try to get him fussed up. First of all you find out where he lives, by watching for the flash, and when you see it you know your friend Archie is sending up one of his little pills. After you see the flash you count ten to twenty seconds, just according to your elevation, and then when the pill is due to arrive, you put your rudder hard over and pop!! goes Archie where he thought you would be—but aren't! It's great sport dodging Archie! Well, you go on about your business, making your observations or whatever you have been sent up to do, and you keep in mind just about the length of time it takes for Archie to get busy again. Then you watch for the flash and repeat the previous performance, and so on until he gets fed up on it and decides to let you alone. Sometimes he doesn't play fair, though, and calls in his relatives—all his

sisters and cousins, his uncles and his aunts—and the whole family start in at you and fill the air with things that could not be called pills—furniture, "grand pianos," "billiard tables," "arm-chairs," and any other good heavy furniture you can think of—and when that starts you usually decide to pack up your troubles and head for home. (Laughter).

One of you gentlemen here today mentioned something about the use of range-finders for locating some special object at a distance. You don't need them when you have an aeroplane because all you have to do is to hop into your machine and go and see it. There simply is no end to the possibilities! Think of the work you could do by means of squared maps such as we use at the front,—ordinary maps of a certain scale, marked into squares—

THE PRESIDENT: But we have no maps.

Making Maps in the Air

MAJOR KENNEDY: Make them with aeroplanes, then. It's a very simple matter. You could map 1,000 square miles in ten days, and then when you have your maps, mark them off in squares and number the squares. Give a set of sheets to the chap who is doing the flying, and have a set back at the station. Then, supposing the flyer locates a fire, all he does is look at his map, get in touch with the station (either by wireless telephone or telegraph) and say "Trouble on Square 1," or

"Square 2" or "Square 3," as the case may be. Then the chap at the station takes a look at his map and knows immediately just where the trouble is and can send help at once.

Carrying Men

THE PRESIDENT: An important question in this connection is the possibility of the operators taking the machine close to the fire and going in to put the fire out, or, if it is too big for them to handle, to go back and get more men to help. Would that be possible?

MAJOR KENNEDY: It certainly is. You can do nearly anything with an aeroplane. (Laughter). Well—you can! I know of several harbour cities where they are used for fire fighting; they are fitted up with a small wireless installation, and fire engines. That equipment down there in the corner (indicating pump and fire fighting apparatus) could be carried in an aeroplane with no trouble at all. You could take that pump, connect it up with the engine you use to run your propeller, and use it that way. As for landing near a fire, that would depend on the waterways. From what I know of the country it would be practicable to get within a mile or two of any fire.

THE PRESIDENT: Well, that would be all that would be necessary.

MAJOR KENNEDY: As for what you can carry, that all depends on the machine, of course, but you get a big machine and you can carry up to 20 or 30 passengers quite easily.

A MEMBER: Would it be possible to land in a waterway if there were a current of about four miles an hour?

MAJOR KENNEDY: Quite possible, if there were no rapids.

MR. ATKINSON: How great a depth of water would be necessary?

Landing in Running Streams

MAJOR KENNEDY: Anything over one and one-half or two feet, it would depend largely on the weight of your load. Aeroplanes could be designed specially for fire fighting purposes,—they could be designed for landing in shallow water. The

'buses used in those harbour cities I mentioned can land in very shallow water. One thing about making a landing is that you must be careful to land head on to the wind, if it is over eight or ten miles an hour. Of course you can, by skilful manoeuvring, land with the wind at your back, but it is a whole lot better to land the other way. With the wind at your back when you land you are likely to keep on going longer than you intend, and to stop more suddenly than you want to! (Laughter).

THE PRESIDENT: We hear a lot about aeroplanes flying low, doing machine gun work over at the front. Can you tell us anything about what they are doing over there in this connection?

Over the Heads of Infantry

MAJOR KENNEDY: That is one of the several phases of our co-operation with the infantry, and one which has developed a very great deal in the last short while. The Royal Flying Corps were the originators. Of course before any big movement the Flying Corps do a really great work taking photographs of the country where the advance is to be made. They take photos of every road, every bit of trench, in fact, they photograph everything, whether they are being fired on or not. When the infantry goes into action, while they move forward our planes are flying just in the rear of the German lines, gathering up information to wireless back to headquarters, information as to where the German forces are concentrated; where to throw the greatest numbers; where enemy guns are concealed; in fact, any scrap of information which will be useful. Some planes simply go forward with the men from the beginning of the advance to the end, flying perhaps 100 feet above the ground. Some of the planes have machine guns which are fired automatically by the engine, through the propeller. The propeller is geared with a safety device so that when the blade gets in the way of the bullets, the gun cannot fire. In such cases the aim is taken by pointing your machine in the direction you

want the bullets to go. Suppose you see a company down there which you think should be annoyed—you just point your machine that way and let them have it until you decide they have enough, or until you are forced to move on. The aeroplanes also do a good deal of damage to the enemy by dropping bombs, and they are of course of great assistance to the infantry by showing them where the enemy is, and routing out groups of Germans who may be hiding in a shell hole or a small trench, sometimes holding up our advance by means of their machine gun fire. The aeroplanes get after these chaps at once, and if they cannot manage to settle them alone they signal down to the advancing infantry and they do the job.

Getting Messages Back

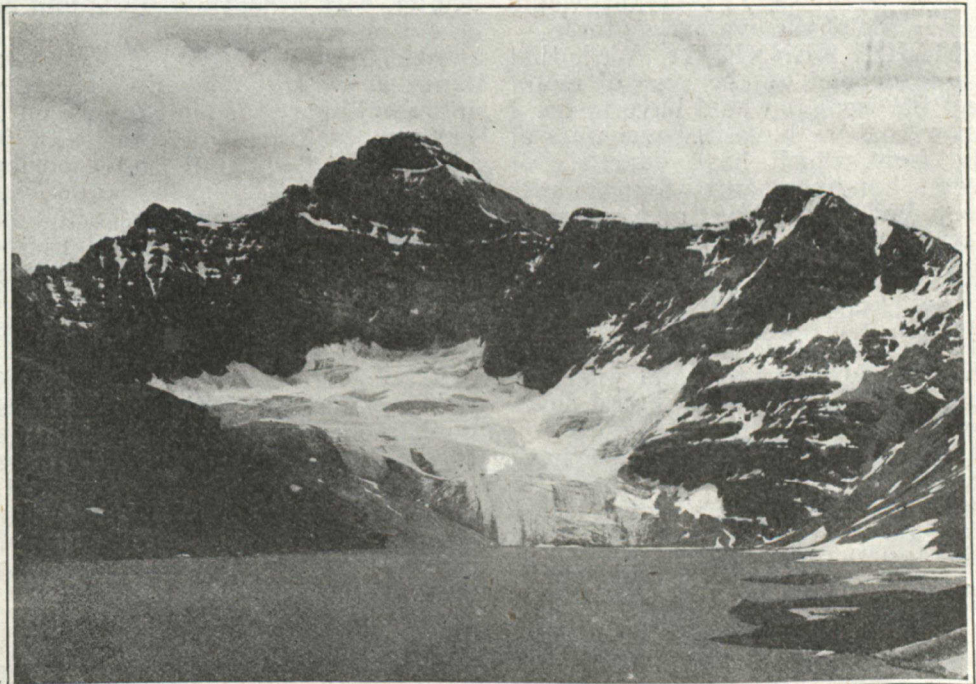
In advance movements the infantry in some parts of course go faster than others, and it is absolutely necessary for the safety of the troops that the higher command, miles further back, should know exactly at what point each unit is, and which sections need to be reinforced. There

are special machines for this work, and they are sometimes called "liaison machines" because they act as messengers. When they cannot get a wireless through to headquarters, sometimes they take a picture, or make a drawing, which will contain the necessary information, and then fly back to headquarters and drop the message and hurry back to get on the job again. In this way, by keeping the higher command absolutely posted on the situation of every unit in the advance, our guns are kept from shelling out people. I think what I have told you just about covers the extent of our co-operation with the infantry.

MR ATKINSON: I have a question I would like to ask. Supposing you have a lake with a row of trees around it, along the shores close to the water—trees say, 40 feet high—how great would the area of the lake have to be in order to make a safe landing ground for an aeroplane, the minimum area I mean?

Alighting in Water

MAJOR KENNEDY: I think in a lake like that if you will take an



LAKE McARTHUR, TRAIL 24, BRITISH COLUMBIA

angle of say 45 degrees from the tops of the trees to the lake, and consider the point where the line touches the water as the boundary of your lake, you will require an area within those points of 200 yards in length as a minimum. It will take mighty good flying to get into a lake that size too, and a slight error in judgment might send you crashing into the shore.

MR. ATKINSON: Then to be safe you would need to have an area about 300 yards in diameter?

MAJOR KENNEDY: Yes, roughly speaking, about 300 yards. It is not necessary that the area should be circular; what you want is to have 300 yards in which you can head into the wind. Outside of that all you need is to have room for your wings.

MR. POWER: In getting out of a lake wouldn't you need to have a larger area?

MAJOR KENNEDY: If you have a good strong wind it would be easy enough to get out of a lake of the size mentioned, but in calm weather it might be hard, especially if you have a big load. Under those circumstances I should advise leaving off some of the load.

MR. KENNEDY: What would be the life of the average motor?

MAJOR KENNEDY: Well, that would depend on the type of motor and the work it would have to do. I know that we have had machines at the front which have done six or seven hundred hours' flying under very bad conditions, and with renewals of various small parts, piston rings, etc., and a general overhauling they can be made practically as good as new. The main thing is to get hold of a good mechanic, but of course over there would not be the same wear and tear on your machines. You'd never get the same conditions here. If you take good care of your machines, have them thoroughly overhauled after every 50 hours' flying, they will last—well, I'd hate to say how long they will last because they might last longer than I'd say. (Laughter).

Flying in a Gale

MR. POWER: Does the wind affect the machines very seriously?

Up where we are the wind comes up very suddenly—one minute the air might be quite calm and all of a sudden a gale blows up. How would that affect us in the use of aeroplanes?

MAJOR KENNEDY: What do you mean by a "strong gale"? Do you mean when it blows about 50 miles an hour or so?

MR. POWER: Yes, about that.

MAJOR KENNEDY: We don't mind a little thing like that at all. Of course it would hold up the speed, but there would be absolutely no danger at all. In Texas they have what they call "Northers." The day will be beautifully fine, and all of a sudden it turns cold and a gale come up, blowing 40 miles an hour and upward. When that happens the pupils usually dive for home, but sometimes of course some of the chaps who don't know any better go up and fool around and have a grand time. Flying in a gale is just like skating against a strong wind. You can keep on going but it's harder work and you can't get the speed.

MR. ATKINSON: Major Kennedy, I would like to ask if a landing can be made on a frozen lake in winter, with a depth of say a foot or two of snow?

MAJOR KENNEDY: You can land anywhere if you have the necessary space. I landed once on a pebbly beach and got away with it all right. Of course it isn't good for your machine, but you can do it. You want to have good shock absorbers though,—they are very necessary. I have landed in three or four inches of snow with wheels, but of course you would have to have skids for landing on ice.

MR. ATKINSON: May I ask another question. Cold conditions don't seem to make much difference to you, but how about sudden changes from extreme cold to extreme heat, heat such as we experienced in the recent fire in Northern Ontario? Would things keep right on working or would the machine be affected?

An Egyptian Test

MAJOR KENNEDY: No. It couldn't be any hotter than it is in

Egypt, and you certainly get extremes in flying there. In mid-summer you get the heat all right, then when you go up three or four thousand feet, which is a normal elevation for flying, it is quite cold. Up higher it is very cold, and if you stay up long enough you freeze. One thing you would have to look out for over here would be to keep your radiators warm. You might find it a bit hard to get started in very cold weather, but not if you keep your machine in a heated building.

A MEMBER: Do you think there would be any trouble experienced in landing in the Rockies?

MAJOR KENNEDY: All you need is a small piece of land of the dimensions mentioned, and I should think you could find that unless you have nothing but up-and-down peaks. I don't remember just how high the Rocky Mountains are, but we have flown over some of the highest peaks in Europe without any trouble. So far as space is concerned, I would undertake to land in the city of Montreal, and not kill myself. I might spoil the machine but I could save myself all right.

MR. HOWARD: How about landing grounds? Would you sometimes have to go very great distances without finding a place where you could land?

MAJOR KENNEDY: That depends largely on your height—how high you are flying—but if you are up 5,000 feet you have a choice of ten square miles to land on. Of course accidents will happen, but they are usually due to people choosing the wrong places at which to land, an error in judgment, you know. But I should think you would get one or two small lakes in an area of ten square miles in this country, where you could make a safe landing.

LAURENTIAN'S FINE YEAR

The first Annual Report of the Laurentian Forest Protective Association of the Province of Quebec makes a remarkably good showing.

The Association was organized rather late in 1917 and therefore had not an opportunity to perfect its organization for the full period of the fire hazard. This Association comprises those limits on the north shore of the St. Lawrence around Quebec and in the Saguenay district. The report of President Robert B. Kernan outlines the construction of a system of look-outs and telephones, and the use of motor cycles in open and extended districts. The cost of patrol and fighting fires worked out on the economical basis of .0031 dollars per acre, the total expenditure for 1917 amounted to \$19,705.73. The total area patrolled for members of the Association was 9,888 square miles.

A Partnership Suggestion!

The Canadian Forestry Association is not a Government institution in any degree. Neither is it affiliated to any commercial interests.

Each year's programme is fitted to each year's receipts. Many important enterprises that should be started at once must wait upon the receipt of membership fees. The Association has no endowment, no reserve funds. Your fee and the next man's fee, decide how much work the Association shall do in 1918.

The copies of the Forestry Journal sent to each member alone cost over 60 cents a year, for printing and engraving. When a member's fees remain unpaid, it means that the general funds of the Association must be drawn upon to meet the cost of his Forestry Journal. Nor does this take into account the fact that the Journal is only a part, a minor part, of Membership. Each member is an equal partner in the main business of the Association, the educational and propagandist campaigns that are building up big dividends for the future of the Dominion.

Millions Lost in Waste Wood

What Investigative Science is doing to turn Rubbish into Real Money

Thirty-six million cords of waste are turned out annually by 48,000 sawmills in the United States. About half of this can be used as fuel in the mills themselves; the rest they have to pay to get rid of. What can be made of this eighteen million cords we are told by Frank J. Hallaner, of the Forest Products Laboratory at Madison, Wis., in an article on "Forest Products," contributed to *The Southern Lumberman*. Scientific research, says Mr. Hallaner, in so far as it can develop the utilization of this waste, is extending our forest resources and providing for industrial development without jeopardizing future supplies. The chief difficulty in utilizing sawdust and shavings is their bulk and low value. The fibre has been destroyed to such an extent in sawdust that it is unsuitable for pulp, and it can not well be used for destructive distillation. He goes on, in substance:

Making Alcohol

"One of the most promising fields for the utilization of sawdust lies in the manufacture of ethyl (grain) alcohol. This process is particularly attractive, because it will use almost any kind of wood waste. From experiments at the Forest Products Laboratory, and consequent improvement in the process, it appears that 95 per cent. alcohol can be produced at a cost of about 15 cents per gallon. Two large plants are now operating in the South.

"To produce the total 1914 output (77,000,000 tax gallons) would require only 2,000,000 cords of waste; and the annual production of Southern pine sawmill waste alone is about twelve and one-half million cords.

"The larger waste at the mill could be reduced to sawdust and used in the ethyl-alcohol process, but there are

other uses to which such material can be put, along with the small, inferior timber left in the woods as waste. In a general way it may be said that the softwood waste of this nature is suitable for pulp and the hardwood waste for destructive distillation. Only 8 per cent. of pulp wood is now mill waste, and this percentage can doubtless be considerably increased. It is possible that by installing barking and chipping machines a sawmill could chip waste according to pulp-mill specifications. These chips could be shipped in bulk for short hauls, or dried and baled for long hauls.

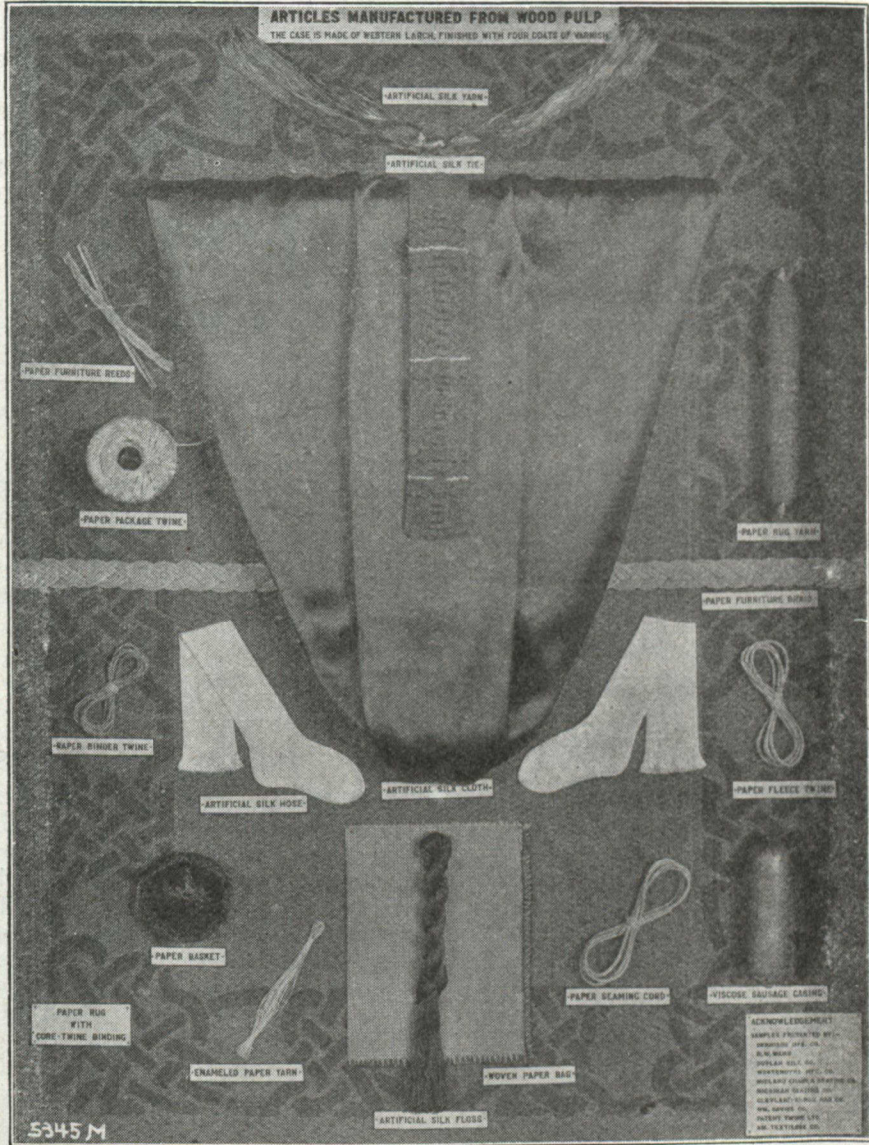
Dyestuffs Produced

"Wood waste is being used in a variety of other industries as a source of tannin, dyestuff, turpentine, and resin. There is a wide field being opened up by the application of chemical research to forest products.

"The early practice of leaching wood ashes as a part of the home soap-making has disappeared, but it is now being revived as a source of potash to offset the shortage of fertilizer due to the war.

"In the Red River Valley of Texas the Indians long ago used Osage orange for dyeing, but it has never gained commercial recognition as a dyewood. Within the last few years, however, the Forest Products Laboratory has succeeded in getting it into the market as a substitute for fustic, which we import from Jamaica and Tehuantepec, and over a million dollars' worth of this dye is now being made by our American manufacturers and this from mill waste.

"The needles or leaves of the coniferous trees are found to have little ducts running through them filled with oil. This oil from a number of species has a very attractive odor and is used in greases and shoe blackings.



Courtesy "Southern Lumberman"

SOME UNUSUAL PRODUCTS OF THE LOG

In Europe the finer needle oils are used as perfumes in soaps. Some are used as inhalations for lung diseases, and as additions to baths and ointments in rheumatic afflictions.

"A chemical analysis is being made of all our native woods. While making the analysis of Western larch, it was noticed that there was an unusually high percentage of water-soluble material. This was found to be galactin. Now, if this material can be converted into a fermentable sugar, which seems probable, Western larch would have a considerable advantage over other woods as a raw material for grain alcohol.

Replacing Silk Worms

"Converting the cellulose into a gelatinous material known as viscose opens up still another field of research for the utilization of wood waste, and adds a new line of products running all the way from sausage casings to tapestry. Many of the silk socks, neckties, and fancy braids now on the market contain silk made from wood. Probably in time to come the whims of the silk worm will have little control over the silk market conditions.

"The kraft paper situation has been one of the most interesting commercially as well as experimentally, and especially concerns the South. Kraft differs from other papers in that it is stronger, due to less severe action of the chemicals. It is brown, like what we usually think of as wrapping paper. Large quantities of it are used for that purpose, and it is particularly suitable for large envelopes. It is used for book covers, for imitation leather, and for cardboard suitcases, etc. Gummed strips are used in place of string for tying packages. Cut into strips, either with one side gummed and spread with a fine lint or used plain, it is run into a spinning machine and twisted into threads. This thread is then woven into such products as onion and coffee bags, matting suitcases and bags, wall covering similar to burlap, furniture resembling reed, coarse mattings, etc. For many years an attempt has been made to produce a paper twine that could re-

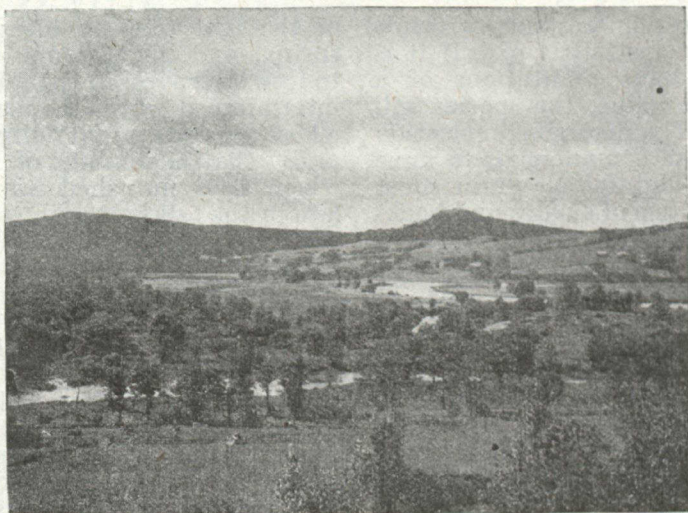
place the binder twines now made from imported fibres. The question became more active again with the recent shortage of these other fibres on account of conditions to the south of us. A successful paper substitute would provide for the utilization of a large amount of wood waste, and at the same time would build up a home industry independent of foreign raw materials. Experimental kraft made at the Forest Products Laboratory, using long-leaf pine mill waste, compares favorably with the best krafts on the market.

Laboratory Work Essential

"We have been as wasteful of wood as we have been of our food. Some of this waste can be avoided by improved methods of manufacture, some of it by manufacture just as left-overs are now being made over in the kitchen, and more can be converted into products of an entirely different nature. There are instances where these things are already being done. It is a field with wonderful opportunities for the application of scientific methods, and investigations by the Forest Products Laboratory are intended to aid such development."

CUT WILLOW FOR LIMBS

TORONTO.—By the stroke of the woodman's axe what was at one time a real beauty spot in the north end is fast disappearing from view in what has always been known as "The Willows," situated on the west side of Yonge street in the Mount Pleasant Cemetery hollow. During the past few days workmen have been busy with axe and saw, removing the old willow trees, that formed in the summer time with the stream below a picturesque scene. The trunks and large limbs have been contracted for by the Dominion Artificial Limb Co. for the manufacturing of wooden legs and arms. The management of the company stated yesterday that there was a shortage of willow at present. The limb company turn practically the entire output over to the Government for the disabled soldiers.



THE VALLEY OF THE KENNEBECASIS

Choosing Trees for Ornamental Planting

BY ODILON BEDARD, F. E., QUEBEC

Having decided on the work of ornamentation to be done, the selecting of the most suitable species of trees to be planted should be then proceeded with. First, we would have to choose between the plants of natural reproduction and those from the nursery. Of course, as far as this is concerned, a great deal must be taken into account.

This work should not be too costly and should above all be practical. For this purpose, plants grown in the vicinity of the proposed plantation are much more preferable, for, once planted, they do not entail any considerable expense for their preservation. While endeavouring to attain an esthetical purpose, it would also be well, if the two steps are compatible with one another, to select the plants in such a way as to secure useful results, whether they produce wood or fruits.

Fruit Trees for Yellow Soils

The one in charge of the work will have to consider the purchase price of the plants, the cost of preparing

the land and the expenses of their care. At certain points, in yellow soil, for instance, a fruit-bearing tree can be planted to more advantage than would be a nursery plant. An apple-tree can be bought for 25 cents, which is cheaper than a tree from the forest. I believe that the apple-tree is the more easily regrown, provided we carefully select a tested variety as the **Transparent Yellow**, the **Wealthy** and the **McIntosh**; at the same time, the apple-tree is the most rustic of all trees. Elsewhere, in wet, acid, rich and calcareous soils, a forest tree will be preferable.

Aesthetic Values

As far as the forest plants are concerned, I believe that those taken in the forest will cost two-thirds less than the nursery plants and are more adaptable to the purpose, especially when they are of a large size. I should advise you then to resort to the nurseries for exotic plants only and for plantations along the highways. In the forest, we will take the plants in soils similar to that in which they

are to be transplanted; this principle should not be lost sight of. If it is desirable to have plantations of a high aesthetic value, the species will have to be of a diversified selection and set in such a manner as to have their shapes and foliage form most attractive designs of shades and backgrounds. The planter will also have to take into consideration the blossom-time of each species in order to match them in such a way as to have the best appearance. All trees have their value, even from the ornamental point of view, and in most cases, they only require to be given a proper arrangement to bring out their most attractive aspects.

Bernadin de Saint-Pierre in his *Studies of Nature* saw gracefulness in willows, while we of Quebec province, find but defects in them. We do not care for them because their leaves are warty and because, in the fall, they soil our lawns. We scorn the poplar because, in the spring, their downy blossoms stick to our garments. However, are there more beautiful ornamental plantations than those gigantic willows which border the Montreal-Quebec route, in the parish of Saint-Paul l'Ermite, and do they not somewhat remind us of the exuberance of the tropical forests? To my mind, maples and elms are not more picturesque.

The basswood, besides being a beautiful tree, is used in an infinite number of ways; the products of this tree will soon be more needed than any other woods of our province. The Carolina poplar is, together with the basswood, the species whose uses are most varied.

Oak, Basswood and Poplar

I should therefore use the two last-mentioned species with the oak, near our villages. In very poor soils, our pines would better alternate with the birches, for the shade of their stems are such as to bring out their respective values.

The ashes, the willows and a few cedars would be planted in wet ground; the elms, the black walnuts and the tamaracks would be best in fresh soil; the red maple, which is one

of the first trees to blossom, in the spring, and likewise one of the first to lose its leaves, in the fall, would be intermingled with the sugar maple whose leaves are not fully developed until the beginning of June and which does not shed its leaves but late in the fall.

Beech too Slow

I should hardly recommend the beech-tree, whose growth is exceedingly slow, and the wild black cherry tree.

I do not mention all the rare species and those which, however common they may be in our city parks, are not yet well known.

In such an enterprise as that of a plantation, economy must be aimed at, in utilising plants which are the least expensive and which are at the same time liable to produce valuable wood or, else, by-products, such as fruits.

(Extracts from a paper read before the second annual meeting of the Quebec Forestry Engineers' Association, held at Laval University, Quebec, on the 6th, 7th and 8th January, 1918.)

LT. W. E. DEXTER IN GOOD HEALTH

In the lists of foresters and forest students overseas printed in the January Forestry Journal appeared the name of Lt. W. E. Dexter as "killed." Although the list was received by the Journal with Mr. Dexter's name so included, it is a pleasure to be able to state that Mr. Dexter at last reports was in good health.

"A WELCOME VISITOR"

"Enclosed find postal note for the sum of \$1 in payment for annual subscription to the Canadian Forestry Journal, which has become a very welcome visitor to my home. Wishing you all success in your important work."

Yours truly,

(Signed) Arthur Boyer.

Montmartre, Sask.

British Columbia Forest Facts

By the Editor of "Industrial Progress"

1. Commercial Forest Area—over 65,000,000 acres, or about one-fifth the total of Canada.

2. Stand of saw-timber—over 400,000,000,000 feet B.M., or about more than half the total amount of Canada.

3. The annual growth is about 6,000,000,000 feet B. M., or about one-sixth the total annual cut of the United States.

Who Owns It

1. Commercial Forest Area—the public owns five-sixths of it outright; nine-tenths of the other sixth it owns in partnership with timber lease and license holders.

2. Stand of Saw-timber.—The public owns one-half of it outright; four-fifths of the other half in partnership with timber lease and license holders.

3. The public has an equity in nearly every foot of timber in the Province. For every thousand feet of timber cut and sold (except from land

Crown-granted before 1887) a royalty of 50 cents or upward must be paid to the public treasury.

What it Brings

1. Yet the annual direct revenue to the Public Treasury from the forests is \$2,500,000. It is one-quarter the total public revenue. It helps build roads and schools. It keeps the taxes down.

2. The wood-using industries now distribute \$30,000,000 per year in the Province. Over 80 per cent. of that is spent for labour and supplies. They contain over half the capital invested in the Province; they employ over half the labour; they pay over half the wages.

3. Utilization of the total annual growth would bring in and distribute \$150,000,000 yearly in the Province. Utilization of the total stand would bring in and distribute over \$5,000,000,000 altogether.

"Patronage" Makes Farewell Bow

The war on patronage in appointments to the public forest services has gained a signal victory during the past six weeks. Definite orders have been given by the Dominion Government that in future no appointments to the Dominion Forestry Branch, which has charge of forest protection in the three prairie provinces and part of British Columbia, shall be made by any authority other than the Board of Civil Service Commissioners, which sits at Ottawa. There does not appear to be at the present time any way in which this most valuable order can be abrogated or modified in future. Certain it is that the selection of men for the field services of the Dominion Forestry Branch are for the first time in history in the hands of the Director of Forestry and his responsible officers. This can be counted a most tangible gain, par-

ticularly by the people of the western provinces, for whose service these officers are retained.

The Canadian Forestry Association waged a continuous campaign for several years past against the practice of appointing men to the Federal and Provincial Forest Services on the basis of their political qualifications. The system played havoc with discipline and was costing the country heavily in useless expenditures.

Word also comes from Toronto that the Government is appointing a Civil Service Commissioner who will have authority over all appointments. A qualifying not a competitive examination is the system that the Government thinks will serve the requirements of Ontario best.

Hon. I. B. Lucas declared in the Legislature that the proposed step

would practically do away with patronage. It is noteworthy, however, that the outside service, including such work as fire ranging, ranger inspection, etc., will come under the Commissioner only when the salary exceeds \$1,000. Very few members of the ranger staff will come inside that class.

Hon. Mr. Ferguson recently stated that no one would receive a ranger appointment this year who is able to qualify for any branch of military service.

The New Brunswick Government has publicly declared for the control of all appointments to the provincial forest service by a non-political board.

When Grand Trunk Ran on Cordwood

For almost twenty years, up to 1875, wood burning locomotives were used on the Grand Trunk Railway. This necessitated great stacks of wood at the stations. More than half of the station yard space was so taken up. A steam saw and gang came around periodically to cut the four foot cordwood sticks in two, ready for the locomotive tender. Enormous quantities of the finest hardwoods, maple, beech and other, were thus consumed. The first coal burning engine, changed from wood burning, in the shops at Stratford, was put into service in 1873. The change from

wood to coal burning took several years. For 1875 the Stratford record shows, 4,197 tons of coal issued and 16,436 cords of wood, this being the maximum wood consumption record for that station. After 1875 the use of wood dropped rapidly. The price of wood began at about \$2.00, was \$2.50 and finally \$3.00 and over per cord. At Berlin Station about 6,000 to 7,000 cords per annum appear to have been purchased. During the 19 or more years of wood burning probably over 120,000 cords were delivered at the Berlin Station. The price rose to \$3.50 per cord about 1874

"Forest Talks" to School Children

One of the many devices used by the Canadian Forestry Association to reach the school children of Canada is through a series of attractively printed "Forest Talks". Each address is accompanied by several large cards containing illustrations, the latter being passed about the class rooms at the close of the reading. School teachers in all parts of Canada are making splendid use of these periodical addresses on Forestry. The following typical comments bear out this point.

Miss Sarah McCaffray of Saint Andrews, N.B. writes: "I have received through the Secretary of the

School Board the first of the Forest Talks. My class is very much interested and we shall be glad indeed to receive more of them. I am sure they are going to be a splendid help to us. By their usefulness in awakening the child's interest in the preservation of our forests they will do much towards making the geography lesson more interesting."

From Mr. T. A. Speirs, B.A., Principal of the High School, Mount Forest, Ont. "The subject was taken up by two students in each form and in that way reached all the students of the school. I would be much pleased to receive similar pamphlets from time to time."

The Forester's Place in the Planning and Operating of Wood Industries

BY W. F. V. ATKINSON, F. E.

Chief Forester and Sup't of Water Powers, Spanish River Pulp and Paper Mills

The Forest Engineer must have accurate acquaintance with finance, mill processes, water powers, and transportation.

I have asked been for a few practical remarks on some points where forest engineering touches related subjects. I shall therefore avoid all technicalities and mention only a few points where it seems to me necessary that the forester should not only be willing, but properly equipped, to handle certain matters and to carry them through to a stage where the work can be more properly carried on by the civil engineer. The forester will thus bridge a gap which is at present very inadequately covered and which my experience has shown should properly be approached from his side. There is no hard and fast line of demarcation but I feel that there is not the proper appreciation of the fact that both foresters and civil engineers can work together in this middle ground until the point is reached where each becomes a specialist in his own line.

Let us suppose a group of capitalists have determined to establish a newsprint plant and that a water power and tract of timber land have been offered to them for this purpose. The civil engineer can tell them what power is needed to produce the amount of paper required to supply the market demand which they have in view, he can measure up the water power in question as he finds it, and can say if it will produce enough power for the purpose, but he should, nay he must, call in a forester if he wishes to know to what extent this water power can be improved and controlled. The operating or development of a power now, without knowledge of its possible control, is among the things of the past in this country.

Watershed Conditions

The forest conditions upon the watershed are a prime factor in this improvement, very much greater than is generally realized. The drainage area probably contains farms and cleared lands, waste areas and barrens, mature and young forest. The forest in turn is either deciduous or coniferous, or mixed. All these conditions have a different bearing on the annual run-off.

The forester's type maps have here a great value, in fact they are a "sine qua non" to a real appreciation of the problem of efficient control. From their topography the area and slope of the various catchment basins can be measured and the required storages established by building dams where possible, with the greatest economy, from a correct knowledge of the size required. A study of the forest types is essential together with a knowledge of the meteorological, botanical, and geological conditions in the order named. And who is better qualified by his training than the forester to appreciate the proportionate value of each—as for instance under the first set of conditions, precipitation, evaporation, temperature, and wind protection; under the second, the ecology of absorption and transpiration, shade and humus; and under the third, the geology of soil percolation, drainage and ground waters.

Some ready formulae may also be found convenient in answering the demands of our enlightened capitalist since too much capital has already been invested in developments without expert reports covering the whole proposition. These formulae should

cover among other things the horse power equivalent to a ton of ground wood pulp, the complementary or auxiliary power required for mechanical and hydro-electric energy, the number of cords of pulp wood, or their cubic foot equivalent, entering into a ton of newsprint of various percentages of mechanical and chemical wood pulp, etc.

Questions for the Forester

This brings us to the main questions a forester should be asked, namely, how much wood is required for the proposed plant and possibly its board measure equivalent under any of the five official log scales in this country, whether the timber property offered is properly related to the proposed annual output and power development, and whether the proposed timber tract will produce wood for a sufficiently long time to pay interest and create a sinking fund to cover the original outlay and produce a fair profit on the venture. Time thus becomes a large, if not the main factor to be considered. The financial expert will state how many years will be required to make this venture a success at a continuous production of and estimated profit on so many tons of, let us say, newsprint. Here again some knowledge outside the line of forestry will be of value in checking up this period as well as a general idea of the cost of such plants.

When the period has been established in a satisfactory manner, a forest reconnaissance survey may suffice to show whether the vendors of the tract of timber offered have made a reasonable statement of its pulpwood stand and if it is all commercially accessible, leaving the forester's type maps and survey to be carried on after the property has been acquired; but the forester should know before making this reconnaissance how much wood is required to produce the given number of tons of paper per day continuously for the period of years which has been accepted as sufficient to make the venture a success. As a result of careful and continuous investigation, tests and measurements, even to the

use of the xylometer, these factors are now available.

Insurance of Investments

A further point which in the initial stages should be prominently brought forward by a forester called upon in the above capacity, is that of insurance or protection of the investment, so that investors, called upon to subscribe to bonds of an industry such as this may be fully aware of the dangers which they run, as a rule cheerfully, because "ignorance is bliss."

With full advisement I feel sure that no capital would be subscribed on a mortgage of such an industry in the shape of bonds unless a special stipulation were made in the bond deed that efficient fire protection should be provided immediately and maintained continuously. Of course, accidents beyond human control will ever occur. Within the last year I had the opportunity to show the President of a large corporation that the Management were incurring a needless personal liability in not providing what experts could show him to be an efficient protection for the invested interests in a large timber tract. I feel gratified to say that this gentleman felt it to be good business policy, at the first opportunity, to "get out from under" the personal responsibility in this respect, to the great benefit, I believe, of the interested parties and the country, which in the last analysis is the bigger loser by neglect of this precaution.

Cheap Transport

I should not pass over the question of transportation of the forest cut to the point of manufacture. This is also in my opinion a large part of the forester's duty. An estimate of the cost of same and of the best means of affecting it should be included in his preliminary report. In most cases in this country where developments of the nature which I have just suggested are undertaken, the river which supplies the power is the most economical road for the forest cut to the manufacturing plant, but in some cases railroading is more efficient and economical and there is, besides, no loss in transit.

Where large quantities of wood must be made so as to amply cover the demands of the mill, some of this wood must remain from one season to another in ponds and lakes. This entails a loss by sinking, apart from careless river driving, unless special steps are taken to prevent it. Here again I have the opportunity of investigating and feel that this may be prevented in a large part if properly attended to.

Finally when the preliminary forest reconnaissance is made, I think our forester will discover that the species of woods required form only a percentage of his forest. Spruce, as we all know, is considered to be the wood most suitable for newsprint. Of course, we know that balsam fir is almost equally good, either for mechanical or chemical pulp, if treated separately to the spruce. Some of the attempts in the past by paper makers to define the quantity of balsam to be used at the same time as spruce have been very amusing, and other attempts to determine this percentage proved absolutely that they did not understand what the trouble was nor how to remedy it. I have known fir to be blamed for troubles which I knew positively were caused by gas irregularities in the sulphite plant.

Harvesting Poplar

If, as stated, the woods specified for newsprint are only a small percentage of the forest stand, the cost of logging operations must be much greater than where, by using other species, a larger part of the mature forest can be cut at the same time. I have in mind particularly jack pine (*P. banksiana*; and the poplars (*tremuloides*, *balsamifera*, and *grandidentata*) which woods are capable of producing very fine fibre if a suitable plant is erected. Improvements in methods of manufacture are being made every day, so that the harvesting of these woods should be recommended.

Lastly, in respect to harvesting the visible crop to the limit of the Crown restrictions: under the present general Crown tenure of timber lands, it

seems hard, if not impossible, to suggest any adequate means for working out a rotation of cuttings or of inaugurating a forest plan to include reforestation or even the protection of the immature growth. The average investor, when told that it takes nearly 150 years to grow a spruce tree, is not interested and fights shy of any such suggestion for lack of a proper qualification of the statement. Thus we find ourselves, as originally premised in these remarks, with simply a period of years during which it is expected to produce the required quantities and kinds of wood.

What Markets?

The result of such work of course changes the forest type and encourages the growth of the rejected species so that they in turn react against the restoration of original conditions. Therefore, it behooves the forester in a preliminary report to indicate a market for woods not actually required in the paper making business in case these woods form part of the property conveyed to the investors in the venture.

Should everything be satisfactory and the business carried on, the information required for the organization and control of the water to supply the plant with power and to float the timber to the mill can be obtained at the same time as the forest survey and type maps are produced, and thus unnecessary cost and overlapping will be obviated. This detailed information of local areas thus serves two purposes at one and the same time, and is essentially the forester's business. In France, the Department des Eaux et Forêts shows what these people, who have produced some of the most able foresters in the world, think about it.

Large Staff Demanded

I think the above will show briefly how forest engineering touches related subjects and indicates that it is necessary for the forester to be properly equipped to handle them to his own advantage as well as to that of his employer. Incidentally, in

order to carry out a proper organization of his forest resources and to control and regulate the water supply, he will require a staff which will be larger and more efficient, than if only one or other of the matters were handled. If the operation should be in unorganized and practically un-

known territory, he will be able to obtain a larger part of the forest information at practically no cost to his company, as the improvements in water power will for a long time pay for this information many times over by increased capacity of the mill.

War-Front Letters from Forestry Men

Captain A. W. Bentley, 48th Brigade, France:—

Having spent nearly two years out here with the guns I was very interested to read about the French Forests. I have never seen a French forest yet except from the window of a railway carriage whilst going on, leave, (three times). The remains of a French forest after our high explosive shell has done its work, is only fit for firewood and that is so full of splinters that a saw cannot be used. Wedges are the only means of splitting up the pieces.

I hope to get back some day to where these forests are still intact and unscathed and see one. All our material, beech slabs mostly, is cut up and sent up fresh from the stump. Small pine poles are sent up as gun pit props.

CUTTING ROAD PLANKS.

Sergt. B. M. Stitt, Canadian Forestry Corps, France.

We are still hard at work over here doing our best to supply the growing needs of the front line trenches. We have been cutting white poplar this last two months, most of it going into 2½ inch road plank. About one-third of the total acreage in the valley we are now working is under reforestation and it is highly interesting to note the growth and system of planting the young trees. We have cut some 5 ft. and over at the stump. Most of the trees are planted along creeks and between every row of trees a ditch is dug which is kept full of water regulated by small gates or weirs.

HUN DEVASTATIONS.

Quarter Master Sergeant S. H. Clark, Canadian Forestry Corps, France: I find the French methods of forestry very interesting. This forest has been under Government supervision for many years and the subdivision into compartments based on soil and the resultant types is definite proof of successful management. The organization, of course, is strictly military and prior to this war it was sufficiently trained to go to the front as a unit. Only veterans are in charge now. This forest which was cut over by the Huns about last February consisted of oak, 60 per cent.; beech 30 per cent.; birch, 5 per cent. and the remainder blue beech and ash. Lieut. Tilt made an examination of the area during early summer but owing to the large amount of felled trees which the Huns cut and were unable to utilize before their retreat he found a reliable estimate difficult to make.

Another interesting part of our location here is the daily serenade we receive from Fritz. To date they have caused very little inconvenience other than necessitating a transfer of the crews while the shells are coming over. Of course this relieves monotony and as we have completed the cleaning up of this forest it is probable that we will not be located so close to the line when we move again as it is not customary for non-combatant units to be placed so close to the firing line.

TRAINING FOR A BUS.

Lieut. D. A. MacDonald, Royal Flying Corps, England:—I completed a six weeks' theory course on

Flying Meteorology, and practical Wireless, Machine Gunnery, Engines, Rigging and Artillery Observation, at Reading about three weeks ago and am now undergoing higher instruction in these and learning to fly a "bus." It is the most interesting game I can think of and certainly a wonderful technical education for no cost to yourself. I have felt settled since I finally got started in the R.F.C. which I haven't been since this war started. The R.F.C. has a wonderful equipment for instruction and also is perfectly organized. The average cost to the Government for qualifying a pilot from the time of his appointment until his graduation is high. The largest item of this of course is damage to machines due to crashes. I expect it will be well on in January before I get my wings since we have many different machines to fly for 20 hours "solo" and the weather is too "dud" in the winter months to get in much flying. At present the weather is fair for flying about two days a week.

FLYING IN B. C. SOME DAY.

Mr. Finlayson asked me to give him some news of operations, etc., in my work. I don't know whether he meant Forestry work or Flying. Certainly I think that the new machine would be a wonderful acquisition to the Forestry Branch for reconnaissance and photography work. I am not permitted to discuss its capabilities but I can assure you that it is the fastest machine in the air, and can travel and climb tremendous distances with a passenger and some load of bombs. From the Crowsnest to the Brazeau shouldn't take more than two and a half hours.

NOT A TREE LEFT STANDING

Major W. A. Lyndon: France:— I have been for the past two months living on the battle ground of France. There is not a building standing within ten miles of us. Where the villages stood there is nothing left. It is a sight to see but gets very tiresome to work in day after day among nothing but wreck and ruin. We went through a forest to-day, that is,

what once was one. There was not a foot of ground that had not been turned over by shells, not a tree left standing, only a lot of stumps split and shattered. No protection whatever. It reminds me a great deal of what it is like after one of our big bush fires, only ten times worse.

A TIMBER MAGAZINE.

Lieut. W. J. McLaren of the Canadian Forestry Corps has forwarded an attractive little pamphlet entitled "Timbers," issued by the 112th Company of the Forestry Corps which describes a visit to the scene of lumbering operations in Great Britain being carried on by Canadians. A number of very good illustrations make the pamphlet even more interesting. One of the best pictures is that of the pigs "by-products" they are called by the O. C., which were being raised on the waste from kitchen and messroom.

COTTONWOOD FOR PULP

Sacramento capitalists are now investigating a proposal to put the Sacramento valley cottonwood tree to an utilitarian purpose. It is believed that wood from the cottonwood trees would make excellent raw material for the manufacturer of paper pulp, and if investigation proves this to be so, a paper mill may be started in Sacramento or vicinity. The cottonwood tree is indigenous to the Sacramento valley. It grows principally along the river. It is said by those who claim to know that it is found in sufficient quantities to keep a paper mill supplied for years to come. The cottonwood tree grows to enormous size.

J. Edwin Hall, B.Sc.F., graduate of the University of New Brunswick, and Chief of one of the Forest Survey parties of the New Brunswick Government, has resigned his position and enlisted with the 9th Siege Battery for Overseas Service.

Britain's Penalty for Neglect of Forests

BY SIR JOHN STIRLING-MAXWELL

In a Recent Address before Royal Arboricultural Society of Scotland

Forty Million Pounds Paid Out In Two Years Might Have Been Avoided

For the last three years every one engaged in the organization for war has known how dearly this country is paying for the neglect of a great national industry, (timber production). The Prime Minister has told us that timber absorbs more shipping than any other import, and that we can only ensure imports of food by foregoing imports of timber. He described the situation to the House of Commons "as one which undoubtedly calls for the gravest uneasiness." We have now reached the stage when the use of imported timber, except in small quantities, is prohibited unless it receives official sanction. Recently it has been found necessary to withhold sanction even for the erection of huts for the service of our soldiers and munition workers. There is no seasoned home-grown timber to fall back on, and no time to season any. The demand is too pressing. Everything is used as it is cut. For the army we are mainly dependent on the French forests. Had our Allies neglected forestry as we have done, the war could not at this stage have been carried on at all. I shall not waste time in dwelling on what might have been, but it is only fair to this Society to point out that if its advice had been taken, things would be very different now. We should at least have been secure in the vital matter of pit-wood, and we should have had sufficient men skilled in the conversion of wood, to enable us to surrender the younger men to the army without paralysing our efforts to make the most of our native timber.

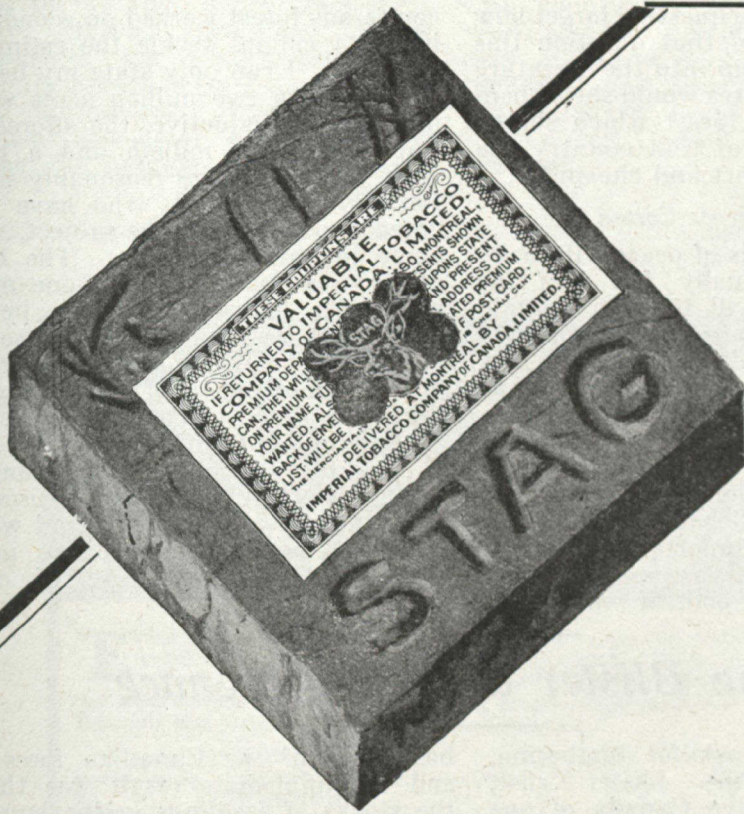
Britain's Penalty, £ 40,000,000

One hesitates to speak of money in these days when money does not seem to count, but money is strength and we still have to face the bill. We had the great good luck to be able to

import timber for the first two years of war, but the cost in increased price, freight and insurance amounted in these years to some forty millions more than we need have paid for home-grown timber. This money might as well have been thrown into the sea. A railway company, of which I am a director, was paying 14 s. for imported sleepers, while home-grown sleepers quite as good were being despatched to the army in France at 3s. 6d. After all, forty millions is a considerable sum. A tithe of that sum, wisely laid out even thirty years ago, would have saved most of this loss and proved a good investment into the bargain.

No Longer a Game of Chance

How far these arguments will be strengthened by the experience of the coming months, we do not know. We can only pray that they may not be strengthened by disaster. They already suffice to convince any thoughtful person that the forest policy of this country can no longer be left to chance. I am not only thinking of war, or of those trade boycotts, which will assuredly take the place of war if the statesmen of today succeed, where the whole world has hitherto failed, in eliminating force from the settlement of international disputes. I am thinking scarcely less of times of peace. Coniferous timber, which composes nine-tenths of our imports, is the anxiety. Should Russia, on which we have latterly been mainly dependent, now enter on a period of development, she will soon, like the United States, herself absorb the whole produce of her forests. The price of timber has for years been steadily rising, and the time is coming when countries which have no timber of their own will fare



STAG

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*Will satisfy you because the natural
flavor of the tobacco is in it.*

very badly. People who talk glibly about the housing question forget how near the heart of that question this matter lies. A dip into the literature of the United States would show them that it was the forest which solved for the builders of that country the problem of comfort and cheapness.

When Peace Comes

While the needs of peace will make themselves gradually felt and increasing prices will tend to provide the required supplies, it is otherwise with international disputes, and it is against the sudden shock of these that the statesman will have specially to prepare. Whether they take the form of war or of trade boycotts, it is certain that the defensive strength of this country will depend on its ability to dispense with imports for a limited period. We have at present three million acres of wood, of which per-

haps two million are or might be coniferous forest worked on economic lines. I cannot tackle the estimate in detail. I can only state my belief that if these two million acres were made fully productive, the afforestation of another million and a half acres would make us reasonably safe. Possibly others here, who have devoted more study to the subject, will agree in this conclusion. The calculation is one which any one may make for himself, imports being reckoned in loads and a load representing pretty fairly the average annual production of an acre of well-managed coniferous wood. Whatever the precise amount to be afforested may be, it constitutes a considerable change. I may leave it to others to discuss today how it can be introduced with the least possible disturbance into the complicated structure of our national life.

Pine Blister a Mighty Menace

Fire, waste, unskilful lumbering, and, above all, the blister rust, threaten to deprive Canada of one of its greatest sources of wealth. Prof. J. H. Faull, of Toronto Forest School, told an audience gathered under the auspices of the Royal Canadian Institute in Toronto recently. While fire, waste and unscientific lumbering have in the past done much to lessen Canada's income from her white pine forests, the speaker said, the great menace of the present hour is this comparatively new pest, the blister rust, which was introduced into America from Europe about twelve years ago. Fortunately it requires two hosts to complete its growth, and by the elimination of one of the hosts the pest may be very effectively combated.

The white pine blister and its destructive consequences, oddly enough, is the result of a strong move for reforestation which swept Canada and the United States a little more than a decade ago. The slogan of this movement was "Plant white pine", which is the

basic tree of the Canadian forests, and the immediate result was that the stocks of seedlings in the hands of American nurserymen were depleted. Some years previous a reforestation movement had swept through Europe, and large stocks of white pine seedlings had been imported from America. This blister rust disease had always existed in the Ural mountains, but its ravages there were not serious. When white pines were set out in Europe, however, the disease became very virulent and attacked practically all the imported stock. When, during the reforestation movement in Canada and the United States, American stocks of seedlings became depleted, the nurseries sent buyers to Europe for the purpose of securing enough young trees to meet the demand in America. The Europeans were shrewd enough not to inform the buyers of the ravages of the blister rust, and large stocks of seedlings were imported and distributed throughout the white pine districts. The disease requires about three years before it begins to

manifest itself by a swelling of the limbs of the tree, which take on a sickly, yellowish appearance. Once established, the fungus progresses down the branch or stem year by year. Each Spring there arise from the swollen, discolored tissue invaded during the previous year numerous

pale orange or whitish blisters filled with countless spores. About four years ago the prevalence of the disease in our Canadian forests was remarked, and since then a vigorous campaign has been carried out in Ontario and Quebec to eliminate the new pest.

RENNIE'S SEEDS

For Better Gardens

"EVERY back yard should be used for the cultivation of fruits and vegetables"—says the Food Controller's Bulletin. Market Gardens must be worked to capacity. But all this effort is wasted unless the seeds sown are capable of producing sturdy, vigorous plants. Plant Rennie's War Garden Seeds and insure a full crop!

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	pkt.	¼ oz.	½ oz.	oz.	¼ lb.
Cabbage					
Danish Summer Roundhead	.10	0.90	2.75
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Rennie's Danish Dronth-Resisting	.15 & .25	1.00	1.85	3.50	10.00
Celery					
Paris Golden Yellow (Extra Select)	.15	.60	1.10	2.00	
Onion		pkt.	oz.	¼ lb.	lb.
Rennie's Extra Early Red	.05	.35	1.00	3.75	
Radish —Cooper's Sparkler	.05	.20	.65	2.20	
Tomato —Market King	.10	.60	1.75		
Rennie's Improved Beefsteak	.10	.75	2.50		pkt.
Pansy —Rennie's XXX Exhibition Mixture					.25
Sweet Peas —Rennie's XXX Spencer Mixture					.15
Nasturtium —Rennie's XXX Chamcleon Mixture					.10
Stocks —Rennie's XXX Large Flowering Globe Mixture					.20

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A Forester's Impression of England

Mr. Jas. R. Dickson, formerly of the Dominion Forestry Branch, Ottawa, and now with the Forestry Corps in England in a letter to the Director of Forestry says that he has been extremely busy sizing up and reporting on timber and sawmill operations which the British Board of Trade have given the Forestry Corps the option of taking over and carrying through. Mr. Dickson goes on to say:

"Have been engaged so far in the south of England and find the work very interesting and congenial. I think our good friend Ellwood Wilson would have taken a fit had he seen the pair of calipers they sent me out with to make a very careful check valuation survey upon the result of which another forester's fate depended, as his estimate had been seriously questioned. In the first place it was a huge awkward affair, made by a blacksmith, and **all of iron**—so just imagine the weight! And it was made for a left-handed man, with even at that all the diameter figures put on wrong way round, so that our left-handed Hercules was required to read them upside down. Furthermore the long caliper arms were tipped with $\frac{3}{4}$ inch right angled nibs which were forever catching in the rough bark, and even when they were placed just right the diameter measurement was being taken at such a distance from the scale, and there was necessarily so much "play" in the moveable arm that one could only hope to be somewhere within an inch of the "correct answer." With the unaided eye I can estimate to within a half-inch error, so that after all one's work with them these English calipers were, you may say, twice as bad as nothing.

"The small local sawmills in English woods, cutting 3 to 6 M.B.M. per day, turn out a fair quality of stuff but cut rather a pathetic figure beside one of our big Canadian mills. When they get an extra big log at one of those little mills it's funny to see "all hands and the cook" piped to shove

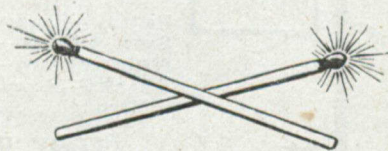
on the carriage and so help the poor fellow at the windlass win through.

An Even-aged Stand

Most of the Scotch pine I've been working in was planted just after the Napoleonic wars and is therefore about 100 years old. What a difference between one of these perfectly pure even-aged stands, with often not a piece of debris or bit of underbrush to be seen anywhere on the mossy floor, and roads or "rides" as they call them, intersecting everywhere; and, say a typical corner in the Riding or Duck Mountains with weed trees hogging most of the ground and a mass of debris and underbrush so dense that a mile an hour is good going even using both hands to save your eyes and a little Latin to save your temper.

"In a word one can pick up in the old land some splendid ideas both on how to do things and how not to do them. In the latter regard one of the

ASK  FOR



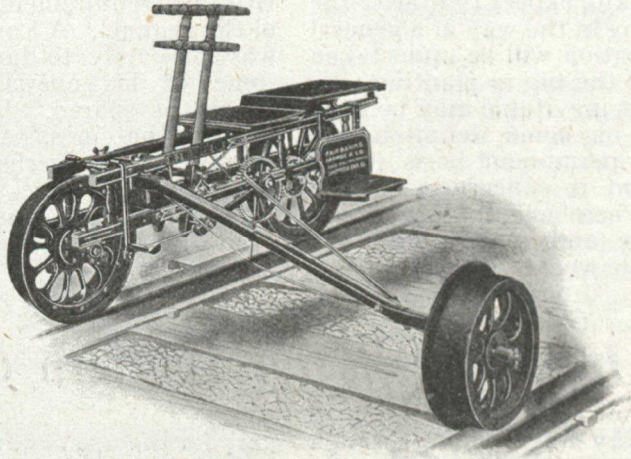
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first things to strike you is the haphazard way in which forestry work has been so far attempted. I hope and indeed quite expect that after the war something in the way of a general land classification will be undertaken in order that the big re-planting program which is inevitable may be gone ahead with on some definitely organized and permanent basis so far as the nation is concerned. The people both here and in France are wailing more and more about the way in which we are slashing down

their fine old forests—and "pity 'tis 'tis true." For our Corps is now supplying nearly three-quarters of Britain's requirements on both sides of the channel. A Lord from Scotland was here only to-day to plead that some of his cherished old woods should be spared. It is satisfactory to note that in spite of our tremendously heavy overhead charges the Corps is still able to provide the government with timber products at a cost fairly well below the regular market prices."

New Lecture Sets for Western Canada

The Forestry Association, through the co-operation of the Dominion Forestry Branch, hopes to have available within the next few weeks, several new Travelling Lecture Sets which will have their headquarters at Winnipeg, Prince Albert and Cal-

gary for the use of our Western members and friends who desire to conduct illustrated lectures on forest conservation in their localities. Each set will have a complete manuscript, and at least fifty lantern slides.

Applications for use of these sets are invited by the Association.

8 Lectures a Week by Travelling Outfits

Four Travelling Lecture Sets are in constant use by the Canadian Forestry Association, reaching hundreds of men and women and school children, Boy Scouts, etc., every week.

The following are typical experiences from Saint John and West Saint John N.B., where one of the sets recently was used by two organizations. Each set consists of fifty-five excellent lantern slides, many in natural colors, and a complete manuscript, containing a popular lecture and fifty-five descriptive paragraphs for the slides. The four Sets are kept moving from town to town and are responsible for at least eight illustrated lectures on forest conservation every week.

From Mr. James A. Estey, Estey & Co., Saint John, N.B.—"We duly received your lantern slides and we had our lecture on Tuesday evening. We got a very fine representative

audience. The lecture and slides were much enjoyed and the after discussion combined with the lecture will prove an assistance in forest conservation. We varied our evening, somewhat, and one of our Associate members read for us "The Lumberman" by Whittier. Last Tuesday evening we followed up your lecture with "An Evening with the Province Beautiful". Forest conservation and preservation got a place, of course."

From the Saint John Telegraph:—"The necessity of conserving the forests of the country was again shown to a large audience in Charlotte Street Baptist Church, West Saint John, last evening, by Rev. J. H. Jenner, and the subject proved a very interesting one to those present. The lecture was provided by the Canadian Forestry Association and it covered the subject in a very interesting as well as an instructive way."

FROM NEW BRUNSWICK.

Woodstock, N.B.,
January 1st, 1918.

Canadian Forestry Association:
Ottawa.

It is to me a pleasure to write my appreciation of the great work you are doing in the matter of forest protection and growth. Truly we hold a great trust, a princely heritage. Our duty is to make it more profitable and pass on to our successors more productive and richer than it is today. Enclosed please find card with two new subscribers.

G. W. SLIPP.

UP-TO-DATE WOODSMAN

He was preparing his home lessons. His father, a struggling tradesman, was listening to him reciting some poetry:

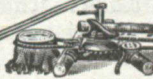
“Woodman spare that tree,
Touch not a single bough,
In youth it sheltered me
And I'll protect it now.”

Taking the book from the boy's hand, the father wrote in pencil:

“Woodman cut that tree,
Spare not a single bough,
In youth 'twas dear to me,
But coal is dearer now.”

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Heading Off the Fire Season

In order to head off the 1918 fire season with as much direct educational work as possible, the Canadian Forestry Association is at present working out the details of an extensive programme by which a number of French Canadian lecturers will be sent through the timbered districts of Quebec, holding public meetings, giving lectures illustrated with stereopticon and motion pictures, with similar work carried out by English speakers in the northern parts of Ontario and New Brunswick. This work was commenced in March by the sending of Mr. J. A. Doucet on behalf of the Association to the northern districts of New Brunswick. Mr. Doucet was released for three weeks' work by kindness of the Dominion Forestry Branch. He has completed an itinerary of Petit Rocher, Bathurst, Grand Anse, Paquetville, Caraquet, Lameque, Tracadie, Rogersville, Moncton, Memramcook, Jacquet River and Campbellton.

Valuable educational work has also been commenced in the Gaspé Peninsula, contiguous to the territory in

which Mr. Doucet has been working. Mr. J. D. Brule, Eastern Manager of the Southern St. Lawrence Forest Protective Association, has been giving a series of illustrated talks at well-attended public meetings, using a lecture equipment with lantern slides provided by the Canadian Forestry Association. The Forestry Association hopes to have at least two other lecturers at work in the month of May, through most of the strategic points in the timbered district of central and western Quebec and in Ontario.

As an introductory enterprise, a number of motion picture films are being circuited in the outlying motion picture theatres of Quebec, each film being accompanied by lantern slides bearing fire warnings, some of which put the argument for forest protection into one or two striking sentences. These slides will be supplied in the French and English text and to any readers of the Forestry Journal desiring copies to these. The first group of these slides, six in number, can be secured at thirty cents each.

Canada's Profits From Her Forests

By R. S. Pringle, K.C., Paper Controller, at Annual Meeting
Canadian Forestry Association, Montreal, Feb. 6, 1918.

Canada was fortunate in having vast timber resources, and having on the one side the European market, the greatest in the world, at its doors the United States, the second greatest market, and on its Pacific Coast the third greatest market, that of China, Japan and Asia generally. That the Dominion was ready to meet conditions, was shown by the fact that it was the third greatest timber country of the world, Russia coming first, and the United States second.

After the submarine warfare attain-

ed great proportions, prices of paper products rose so rapidly that the United States Government appointed a commission to see if there were not a combination to enhance prices. Then, early in 1917, the Canadian newspapers became alarmed at the prices proposed by manufacturers of news print.

Must Guard Newspapers.

"The newspaper has become a necessity in every country," said Mr. Pringle. "It is possibly the most potent factor in keeping up the esprit du corps of any nation. What

would have happened here had it been in the power of the manufacturers to shut off the press of this country, and we were to find some morning that the press had been obliterated, and no news could reach us, can hardly be thought of."

Consequently, when it was represented to the Government that a condition had arisen which might endanger the publication of newspapers, the Government did what every government was doing today under war conditions. They investigated whether they should drop the laissez faire attitude and intervene to see that an adequate supply of news print was furnished to the newspapers throughout Canada.

As a result, in April, 1917, an order-in-council had been passed authorizing the Minister of Customs to fix certain prices at which news print could be supplied to the press of Canada. The manufacturers took the ground that these prices were unreasonable, and that if they were given an investigation, they could show that, with the increase in cost of pulp and everything else going toward production of news print, they could prove their contention.

That investigation had been granted, and had gone on, said Mr. Pringle, but he regretted to say that it was still pending, and no official decision had yet been arrived at.

A Huge Industry.

Proceeding to give some of the results of his enquiry, Mr. Pringle said that in 1870 there were only 21 paper mills in Canada, and these had grown to 52 in 1917. The capital invested in 1890 had been \$4,672,211, which by 1915, had grown to \$86,110,566, and it was at present well over \$100,000,000.

In 1870 there were 760 men employed in the industry, with annual wages of \$197,815. By 1915 this had grown to 10,952 employees, and the wages to \$7,574,856. The value of the product was, in 1870, \$1,071,676, which had grown by 1915 to \$29,395,535, and had shown still greater increase in 1917. In July last, there were being manufactured in Canada 1,900

tons of news print every day, and today the figure was over 2,100 tons daily.

Similar progress, said Mr. Pringle, had been shown in the pulp industry, and he quoted elaborate figures to show the reasons for this growth, with its natural result in a great increase in the production and value of pulpwood.

Without attempting to criticize any provincial arrangements, Mr. Pringle insisted upon the necessity of a scheme of co-ordination with a view to conserving the national lumber resources and preparations for reforestation. This, he argued, was not merely a national question, but an Imperial necessity, since Canada was the greatest source of lumber in the British Empire, and with the depletion of resources that had gone on during the past few years, Great Britain would in the future inevitably look to Canada for supplies, especially in the reconstruction period after the war.

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Mr. Reed, the author has a happy faculty of entertaining description. Every bird is the subject of a compact and fascinating paragraph or two, and the coloring is practically perfect.

The forestry Journal secured five hundred copies at such a price as enables it to quote to its readers, as long as the five hundred last.

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We have such a book packaged ready for you. In the bookstores, it sells commonly at \$1.50. (The illustration above shows the paper-bound edition priced at one dollar). The journal has arranged for a limited edition of leather-bound copies to sell to our readers for \$1.00.

The book contains 265 pages and 61 full-page illustrations in color of the North American wild animals in their native haunts.

The text is by Chas. K. Reed, who has won much fame through various nature books, and the plates are in natural colors by H. P. Harvey.

The book is shaped conveniently for your pocket. While authoritative in matter, it is brightly written and will pay high dividends in helpful and interesting reading.

Enclose a dollar bill to the Canadian Forestry Journal, 119 Booth Building, Ottawa, marking your name very plainly on the attached coupon:

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**BRITISH COLUMBIA'S
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There are at the present time 290 sawmills in British Columbia with an approximate yearly capacity of two and a half billion feet, also some 70 shingle mills, with an approximate capacity of two and a quarter billion. Pulp and Paper Industry.

	1915	1916
	tons	tons
Paper manufactured	50,307	65,229
Sulphite wood pulp	13,000	14,389

For the year 1917 the output should be considerably increased as the large new plants of Swanson Bay and Ocean Falls have been working continuously. It is expected that the pulp and paper mill now building at Port Alice, will be in operation early in 1918.

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A Tree Made Famous by the War

BY POLLOUGH POGUE

Along the Pacific coast from Alaska to Oregon grows *Picea sitchensis*, the spruce that the war has made famous. For many years it grew and fulfilled the function of existence without getting any particular publicity. It is the largest of the spruces and always contributed a large proportion of the spruce cut of British Columbia. In 1915 it formed about half the cut. Under the commercial name of silver spruce, its lumber was favorably known for its strength, lightness, and lack of taste and smell. These qualities made it a favorite wood for box making and co-operage work, especially desirable for boxes intended for foodstuffs. It was also used in the manufacture of laminated wood, and large doors for garages, freight houses and dock sheds.

While lacking the structural strength of Douglas fir, it was used in building construction for framing, sheathing, joists, subflooring and shelving, and for many other light uses. The different species of spruces collectively have for many years supplied more lumber and the spruce cut has had a higher total value than any other kind of timber in Canada. In 1915 spruce lumber valued at about \$24,000,000 was produced in Canada. Silver spruce was also called giant spruce, Sitka spruce and tideland spruce. It is not found in any other province of the Dominion. Its average value under any of these names in 1915 was about \$15 a thousand feet board measure.

A Forest Parvenu.

The war has taken silver spruce out of obscurity, given it a new name, aeroplane spruce, under which it is worth eight or ten times as much as it was under any of its old plebeian names. When the great aeroplane construction programmes of the Allies created an enormous demand for the highest grade of spruce available, silver spruce woke up one morning and found itself famous. Previous to this,

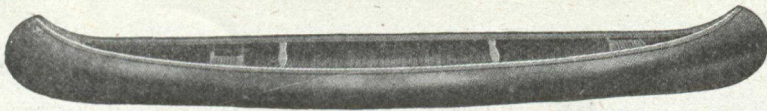
the white spruce stood higher in popular favor. Designers and constructors of aeroplanes, however, recognized the special qualities of silver spruce which make it desirable for airplane building. Full grown trees average 150 feet in height and four feet in diameter. Some trees grown to a height of 200 feet and a diameter of between 10 and 15 feet. The tall straight trunks, tapering very little, provide the long wing-beams and other parts on the aeroplane for which long lengths of timber are required. A length of from 18 to 35 feet is demanded for wing beams on various types of planes, and silver spruce is the only tree that will furnish such long straight sticks. Silver spruce is also unusually clear, tough and strong for its weight, which is only 25 pounds to the cubic foot.

It is extraordinarily even in the grain and long in the fibre. It is non-resinous, odorless, and does not warp or split. The northern silver spruce which grows in British Columbia, is the best of the species, and the only really satisfactory timber for aeroplane construction. It is especially fine in texture, clear, and free from defects. There is no difference between sapwood and heartwood. The color of the wood is white. It is soft and easily worked. The silver spruce of Northern British Columbia surpasses for the construction of aircraft, timber found anywhere else in the world.

Cost of Airplane Spruce

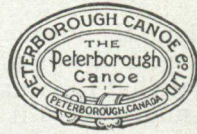
The Imperial Munitions board is paying \$125 a thousand for B.C. aeroplane spruce. This seems a high price, but it is only selected timber that will bring this price. The freight charges on spruce from this province to the aircraft factories of Eastern Canada is over \$100 a thousand.

The spruce actually worked into aeroplanes costs the government much more than these figures indicate for there is considerable waste.



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