Canadian Forestry Journal

Vol. XIII NOVEMBER, 1918 No. 10

SHOWING HOW A BRITISH COLUMBIA SPRUCE LOG IS "RIVED" IN PREPARATION FOR AEROPLANE MANUFACTURE. (PICTURE BY COURTESY "THE LUMBERMAN.")

Canadian Forestry Journal

CIRCULATION 6800 COPIES MONTHLY

ROBSON BLACK, Editor.

Vol. XIV. WOODSTOCK ONT., NOVEMBER, 1918 No. 10

CONTENTS FOR NOVEMBER

The Canadian Forestry Journal will be sent to any address for one dollar a year, subscription including all other publications of the Canadian Forestry Association.

Address all Communications to

THE CANADIAN FORESTRY JOURNAL
206-207 BOOTH BUILDING, OTTAWA

Printed by the Rod and Gun Press, Woodstock, Ont.

Entered at the Post Office at Woodstock, Ont., as second-class matter.

Britain's Need---Canada's Opportunity

By Sgt. James R. Dickson,

Canadian Forestry Corps, England, late of Dominion Forestry Branch Technical Staff

Is Canada Prepared to "Grasp Occasion by the Hand" ---A Striking Discussion of After-War Conditions

These are fateful days of change, when the great surging torrent of this World War is sweeping away old conventions and customs, and in no other sphere is this tendency more marked and more potent than in international trade. When the flood subsides it will reveal world commerce beginning to flow along many new or altered channels, and for Canadians one of the most profitable and far-reaching of such after-war trade developments may well be found in Britain's imported timber requirements.

In order to grasp the situation it will be well briefly to consider Britain's position in this respect in 1913, and what the outlook is likely to be in 1920, as influenced by the war.

Pre-War Conditions.

The British Ministry of Reconstruction has recently issued a most informing and well-considered Final Report dealing with the whole question of Forestry in Britain; both from the standpoint of a National War Insurance Policy and on the broader basis of total trade requirements. The conclusion of the large and representative Committee who prepared this Report is that the question of Britain's future supply of coniferous timber is: "A very grave and a very urgent matter," and they regard the possibility of obtaining this supply from Canada's timber farm as: "An Imperial question of the first magnitude, which deserves the immediate attention of the Imperial and Dominion Governments."

Members of the Canadian Forestry Association who wish to acquire a basis of information for the consideration of this problem would do well to become familiar with the data and findings of this most interesting and important Report.

This Report indicates that in 1913 Britain imported the equivalent of some 650,000,000 cubic feet of round timber of such species as might have been grown at home, that is to say exclusive of tropical woods. She imported in 1913, 90% of her total needs in wood, wood manufactures and wood pulp. For the past several decades the British per capita demand for wood and wood products has been increasing three times as fast as the population, and during recent pre-war years this *increase* has been, in concrete figures, approximately 5,-000,000 cu. ft. per annum.

In 1913 British forests covered less than 4% of the total area of the country and were producing less than 15 cu. feet per acre per year, whereas the other Great Powers of Europe (except Italy) had from 20 to 40% of their total areas in forest, with acre yields of from 25 to 90 cu. feet per annum. depending on the measure of science employed. From all of which, and many other comparative facts which might be quoted, we see how extremely dependent on outside sources of timber supply Great Britain was at the outbreak of this war, and what an insignificant place she accorded to the great Science of Forestry.

In 1913 Russia supplied, roughly, 50%, and other foreign countries some 30% of the timber imported by Britain, leaving (outside her domestic production of 10%) only a paltry 10% that came from sources within the Empire,—i.e. practically, from Canada and Newfoundland. This Canadian quota of some 35,000,000

cu. feet was relatively less than half what it was at the beginning of this century, whereas in the same period our Canadian exports of wood and its products to the United States had nearly doubled in value.

Such then, boldly outlined, was the position of the British timber trade and its main channels on the outbreak of the "Great War."

The Outlook for 1920.

The effect of the war on Britain's timber supply has necessarily been very great. Should the conflict last another year her native forest of commercial value—both capital and growing stock—will largely have vanished, and for the rest of this century it must remain all but negligible as a factor in supplying her markets. Then, of course, Britain's enormous overseas timber trade with Russia and Scandinavia has been very seriously interfered with, and whether it will again renew its old channels is a matter of growing uncertainty and concern. In this connection we must not forget that for many years both Norway and Sweden have been growing apprehensive of the way in which their annual cut was exceeding the annual growth, and that during the 15 years preceding the war their annual exports to Britain fell off by 30%. When the war ends the available supply is apt to be largely absorbed for many years by the vast near-at-home demand for deferred and reconstruction projects of every kind throughout the war-swept zone. Moreover the profound social, economic and political changes occurring among the Russian people will probably ensue in a general higher standard of living and an industrial development that must more and more limit and restrict their available timber for export. Therefore it comes that today we see the people of Britain in general, and her Industrial Captains in particular, developing an unwonted interest in Forestry matters. She is eying the World's distant, decreasing woodlots, meditating over that inescapable "long time" element and saying to herself, as it were: "Now, what is the best solution?"

Canada's Opportunity.

"There is a time" in the affairs of nations as well as individuals, no doubt, which "taken at the flood leads on to fortune," and what a stroke of good fortune, both for patriotic and business reasons, to have this chance of linking up the Empire's greatest timber farm with its greatest market!

Sir Wilfrid Laurier once succinctly defined Conservation as "Wise use, wisely regulated." Let us, as Canadian citizens, sovereign joint owners of our great timberland farm covering 70% of the Dominion, apply this principle to its development with our ideal: Every acre a producing acre, and every acre to its best use.

Britain has vainly tried to establish Forestry under private ownership of the Nation's timberland. The "long time" element damns every sporadic effort. Here in Britain they are still in the futile stage of trying to educate private owners on Forestry matters, instead of educating public opinion. We Canadians are fortunate in being in large measure free from this "stumbling block," but it behooves us to see to it that the insidious hand of Privilege is not permitted to undermine this only and essential basis for a real forest policy. Viz: What guarantee have we that the present Federal Procedure as regards transfer of Berth Licenses is not creating "vested rights?"

It is easy to say: "Apply a Principle," but the problem thus placed before us is, of course, a great and many-sided one. As I see it the chief factors are:

1. *Education of the Body Politic,* so as to bring the Canadian communities—whether Dominion wide or Provincial—who own practically all of our absolute timberland, into a position where the Executives concerned will be given adequate authority to deal with all matters affecting production and disposal of the timber crop, under the driving power of a strong, active, well-informed Public Opinion. In this pioneer field of propaganda the Canadian Forestry Association has already

done very much excellent and essential work, the fruits of which we see in the several vigorous Government Forestry Organizations. But still our great need is for further education.

II. *Organization*, which shall satisfactorily relate together on business and scientific principles the community of interests involved—to wit, the Sovereign people, Owners of the Land and providers of Labour, the Lumberman, who furnishes Capital and Enterprise; and the Consumer, who offers the market. Among the more important features of such organization would be:

III. *Land Classification* to enable permanance of use and stability of policy.

IV. *A System of Protection* providing adequate security against fire and other enemies.

V. *Applied Science in the forest*, to build up a normal growing stock of the favored species and thereafter ensure a steadily-improving, sustained annual yield. This technical work calls for a personnel of trained men, versed in silvicultural practice: the management of forest experiment stations; wholesale collection of tree seeds; the combatting of insect pests and tree diseases; the skilful handling of nursery and seeding operations; the preparation of clear, concise Reports and Bulletins, and having sufficient knowledge of forest mensuration and engineering to most cheaply and easily harvest the timber crop, and supervise the construction of such permanent improvements as roads, bridges and Ranger cabins. And lastly, organization should provide for:

VI. *Satisfactory Transport Arrangements* by land and sea, and the development of the British Market.

It must be evident that a great export trade in Canadian timber—chiefly "White Deal" and wood pulp from the eastern Provinces, and dimension stuff from British Columbia, through the Panama Canal—is dependent upon return cargoes for the transport lines or tramp steamers involved. Nor is this any mere detail in the scheme but an important and determining factor in its successful working out. It simply amounts to this, that if Britain is to take Canadian timber and timber products she can only do so by exchanging some kind of goods in return. The hoary old fetish that in international trade gold can be got for goods, has long whiskers now, and is getting so many hard knocks these days; that it can hardly survive the war.

We see then that this splendid prospect for the profitable development of our Canadian Timber Farm is conditioned on securing greater freedom in trade relations between Canada and the Mother Country, and probably it is here, on a question of economic policy, that more education and effort will be required than to solve either the technical or marketing problems involved. However that may be, there is no doubt at all that the close of this war will unfold for Canada a wonderful opportunity to acquire the profit and honour of becoming Fir-and-Spruce-Grower-in-Chief to the Empire. Are we prepared to "Grasp Occasion by the hand?"

LATE F. B. ROBERTSON

Pte. F. Bruce Robertson, formerly of the Dominion Forestry Department, who has paid the supreme sacrifice for king and country, was killed in action on September 9th, his twenty-sixth birthday.

Before coming to Ottawa, Pte. Robertson attended the faculty of Forestry, University of Toronto, where the honor of class president was conferred on him by his fellow students. He was granted his degree of Bachelor of Science in 1914 leading his class. From then until his enlistment in October, 1915, he was employed in the Dominion Department of Forestry. He went overseas with the 4th University company, reinforcing the Princess Patricias, and later was transferred to another battalion. He had been through several important engagements.

Shocking Loss of Life, U. S. Forest Fires

Five Hundred Bodies Recovered in Minnesota Holocaust of Middle October

Duluth, Minn., Oct. 13.—With probably five hundred persons dead, thousands homeless and without clothing, and with property damage mounting far into millions of dollars, whole sections of northern Wisconsin and Minnesota timberland, to-night are smouldering, fire-stricken areas, with only the charred ruins of abandoned, depopulated towns to accentuate the general dissolution.

The bodies of seventy-five victims lie in Duluth morgues. Hundreds more along the roads leading to Duluth and Superior lay where they fell when overtaken by the fire.

Twelve thousand homeless and penniless refugees, all in need, more or less, of medical attention, are quartered in hospitals, churches, schools, private homes and in the armory here, while doctors and nurses sent from surrounding communities attend them, and nearly every able bodied man in the city has been conscripted to fight the flames which now are dying away.

Definite confirmation was not available, but incendiaries were driven away from a local shipyard when the fires in Duluth and Superior were burning at their height, according to F. J. Longren, fire marshal, and other city and state officials.

Reports reaching here by courier told of widespread destruction, but it was evident that in most cases the fury of the flames was spent. Duluth and Superior are in no further danger. Virginia is safe and Brainard was untouched. However, peat bog fires are now said to have menaced the latter city.

Greatest loss of life and property damage is believed to have occurred in the Cloquet region, where a number of towns have been destroyed and all semi-rural settlements virtually wiped out.

A special train of 20 coaches brought 1,500 refugees from Cloquet and Carleton. They confirmed reports that many persons lost their lives in those towns.

A $35,000,000 LOSS

Should the insurance loss equal or exceed $15,000,000, and it is believed that it will be fully that much, the recent forest fires in northern Minnesota represent the greatest conflagration since the San Francisco fire in 1906, according to the "Insurance Field." The property loss is placed at $35,000,000. The biggest property loss was at Cloquet, Minn., where the loss on lumber alone is placed at $6,000,000, with the town suffering a million dollars more. These figures take no account of the destruction standing timber and young growth.

SOLDIERS FIGHT FIRES

Aberdeen, Wash., Sept. 30.—With the woods dry as tinder, following six weeks without rain, logging camps where soldiers are employed, were under strict guard Sunday. One hundred soldiers from Camp Lewis were sent Saturday night to Lindberg, Lewis County where a bad fire was reported to the spruce division headquartrs here, and soldiers were likewise fighting fire at Norton, Lewis County. Major Hightower, district commandant, asked Portland general headquarters of the spruce production bureau Saturday night that troops be held in readiness at Vancouver to be sent any place in the district to assist in fighting fires in case of need.

The most serious fire in Gray's Harbor region Sunday night was that raging in the Matlock district, where the Callow mill and three camps of the Simpson Logging Company had been burned, togther with number of ranch homes.

The Lesson of the Minnesota Disaster

By W. T. Cox, State Forester of Minnesota

A Terrible Waste of Life and a Vast Property by Insufficient Rangers and Lethargic State Policy

Every one is interested in knowing how the great fire calamity came to occur,—the extent of loss of life, what areas were burned over, and how much material damage was done. It will be some time before accurate information is available on some of these points, but enough is already known to render a general statement advisable. Many consider the calamity a mysterious or unavoidable visitation. This, however, it was not, as the forest rangers and others who have made a study of fires will testify. Groups of quietly smoldering fires were fanned by a sixty-mile gale into rulnning fires that united to form a so id front. The force of the gale was so great that the fires were driven forward on a front which constantly diminished in width. The several intense fires, therefore, were in comparatively narrow strips, separated by large belts of green timberlands; and twenty miles is perhaps as great a distance as anyone of these fires traveled.

These fires, like all other great forest fires, resulted from carelessness on the part of a great many people. Incendiarism in the sense of setting fires deliberately to destroy property (through a conflagration) was not the chief cause. The devastating fires of October 12th sprang in the main from slow-burning marsh or bog fires, the number of which had been increasing as the fall season opened up. These fires were set by careless people traveling over peat road grades, by railroad locomotives, or by land owners who were willing to risk their own and their neighbors' families in the hope of finding an easy way of clearing their marsh, peat, or cut-over lands. While fire may at times be used in land clearing, it has been demonstrated that the time and method cannot be left to the judgment of settlers, loggers and railroad companies.

Value of Skilled Rangers

With a sufficient number of forest patrolmen and rangers to see that burning is done only under proper restriction and control, and to see also that any fires which may start accidentally or otherwise are promptly extinguished, there would be no opportunity for a big fire to come into existence and gain headway. Even during a high wind the starting of one fire is not likely to destroy a whole community. The harder the wind, the less the fire would spread out. It then travels in the form of a streak, which can be fought successfully at the sides, and from which escape is relatively easy. It is only when a fire has been allowed to burn long enough to attain a wide front,, or when a number of small fires are close enough together to easily unite thus forming a wide front, that settlements are seriously endangered. Neither of these conditions should ever exist, but to prevent them requires systematic patrol by a considerable force year after year, throughout the danger seasons. A large force of inexperienced help for a few days is of value only in a defensive way and for the time being.

Magistrates too Easy.

During this fire season the few rangers and patrolmen discovered and extinguished hundreds of fires. They arrested 60 persons and convicted 32 persons. Light fines were usually imposed. However, this did not suffice, since many other fires were not discovered or reported until they had burned out or got beyond control.

Although authentic figures have not as yet been compiled, it is known that several hundred settlers lost their lives in the recent forest fires. A great difficulty is that settlers seldom

know the best means of saving themselves,—many of them being new to the woods. One of these fires swept through an Indian reservation, but the Indians were able to take care of themselves and not one was lost. Prompt and vigorous action on the part of the rangers undoubtedly prevented several fires from becoming disastrous, and many people owe their lives to warnings and help given by forest officers.

Fire Hazard Increased.

While the first impression is likely that devastating fires such as these hasten land clearing and development, observations and facts point strongly the other way. Foresters do not ask that their opinions in this respect be taken without further proof, but welcome a thorough investigation to determine exactly what has taken place on the scenes of great conflagrations. Moreover, it is a fact that devastating fires do not remove the fire danger, but frequently render the burned area more subject to dangerous fires. If clearing followed immediately after the fire, there might be some advantage; but settlers are seldom able to undertake land clearing on a large scale. A forest fire does not consume much of the standing timber or stumps. Within three years after a fire, the dead trees are worthless, mostly blown down, and in excellent condition for further fires, which by that time would be fed by a growth of grass, weeds and brush. Any one who realizes what this means would be remiss in his duty if he failed to give warning of the fire hazard.

Law and Enforcement.

The lack of a large enough force of men trained in fire prevention work is the chief cause of the calamity. It was against the law for people to set fires during this period. It is against the law to run locomotives or threshing rigs that set fires. It is against the law for people to ride along highways throwing burning cigars, cigarettes or matches into the dry timber alongside. It is against the law to do a great many things, but a law in itself is of little value unless the machinery for its enforcement is provided. What is one policeman (forest officer) to seven hundred or twelve hundred square miles) or twenty to fifty townships?

The exceptional drouth of the present as well as last year was another factor of importance. It was on account of it that the Forester asked for an order which was issued by the Commission of Public Safety declaring a closed season on burning. This order covered the spring and fall seasons of 1917, and was renewed to cover the spring, summer and fall seasons of 1918. These orders were widely published and conspicuously posted in all directions, but in spite of this precaution and the convictions secured under the order, and because of inadequate forces to police the forested areas, fires developed faster than they could be extinguished and the guilty parties brought to justice.

Over-drainage, a Cause

The feeling that big fires will occur anyway and that it is futile to fight them is a contributing cause of them, and comes from lax reasoning. Fires are not necessary, nor are they unavoidable. A conflagration arises from a small fire allowed to attain large proportions, or a group of small fires when circumstances like wind and drouth are favorable.

In recent years many millions of dollars have been expended in partially draining swamp lands far in advance of settlement. In the absence of control-gates in the ditches, this has resulted in over-drainage, as we have repeatedly protested, and greatly increased the fire risk and waste of timber and soil. As a result, there are thousands of miles of drainage ditches that have made the worst kind of fire traps and the fires in them are most difficult to handle.

Logging Dangers

There has been insufficient control of logging operations, and this too has proved a difficult factor in fire prevention work.

The unregulated scattered settlement of land constitutes not only a needless hazard to human life but a waste of man power. Had the settlers in the burned districts been con-

centrated in areas near the villages there would have been little if any, loss of life. In each place there would have been several sections of cultivated farms and a community of good progressive citizens. There is need for a clean-cut land policy to direct settlement.

The attitude of the judiciary has not been the best. Justices and municipal judges have been slow to enforce the forest law.

There has been insufficient co-operation by railroad and lumber companies in fire prevention work.

Penalties for violations of the forest laws are too light, and the laws are weak in certain other respects.

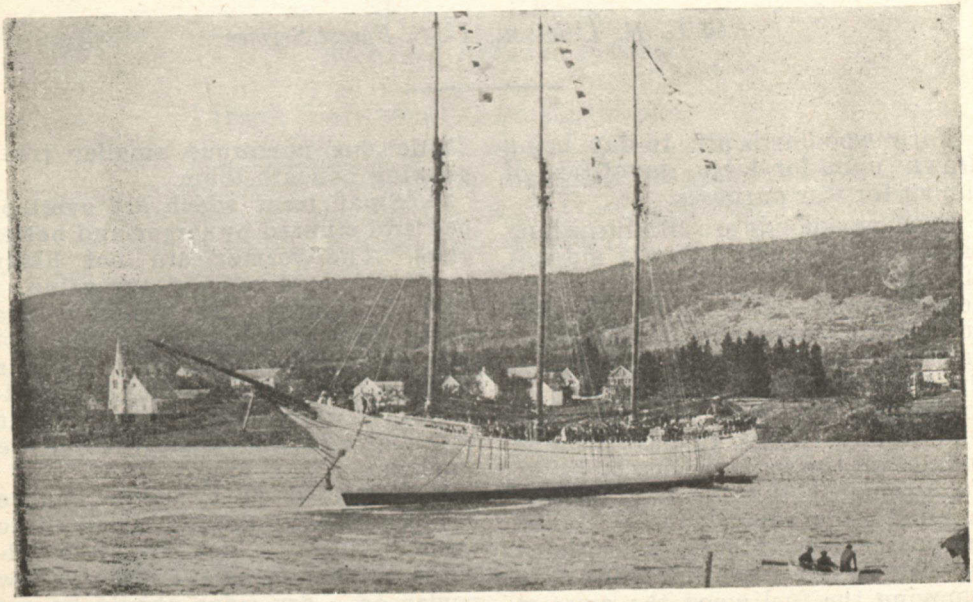
Why Aeroplanes Need Spruce

Many have doubtless been puzzled over statements that the airplane output was limited by the output of spruce. *Engineering and Contracting* elucidates:

"The average airplane contains less than 170 feet board measure of spruce. An ultimate monthly output of 10,000 airplanes would therefore involve only 1,700,000 feet—a really small quantity of lumber. Then why was there a shortage of airplane stock? Until very recently it required 70 feet of timber in the tree to furnish one foot in an airplane. About 15 per cent. of the timber in the tree was clear enough and sufficiently straight-grained to be suitable for airplane stock, and less than 10 per cent. of the stock was used in the finished plane. However, about 20 per cent. of the stock is now used, and the engineers hope to increase this to 30 per cent. The Sitka spruce of northern California, Oregon, and Washington supplies 95 per cent. of the lumber used by our Government and its Allies for flying-machines. This spruce is lighter and more resilient than any other timber available in large quantities, being fully 10 per cent. superior to Douglas fir. Less than a year ago the Spruce Production Division of the United States Signal Corps began organizing the spruce-lumbering industry. There were only 3,000 men in the spruce camps of Oregon and Washington last November where now there are 10,000. Some $3,500,000 worth of logging engines, wire rope, and steel rails were secured for use in these logging-camps, and a hundred mills are engaged in sawing the lumber. Recently the head of the German aviation forces told German reporters that America's talk about producing 50,000 airplanes before the end of the year was only another sample of American bluff. It is well that he thinks so. Our output of these machines is fast reaching a rate that will be quite as amazing to the Germans as our ship building output has become. Liberty motors, spruce, and other airplane essentials have already reached 'quantity-production' rates, and will be delivered according to a schedule that provides ultimately for 100,000 flying machines annually."

Mr. R. H. Campbell, Director of the Dominion Forest Branch is still in the hospital at Winnipeg, but is improving nicely.

Lieut. Wm. Kibly of the Royal Air Force is now completing his course of training in Canada, as pilot. He was formerly fire inspector for the Canadian Northern Railway, and secured a commission with one of the battalions of Highlanders, being afterwards transferred to the Royal Air Force, where he had experience in France as an observer.



A NOVA SCOTIA SCHOONER COMPLETED OCTOBER, 1918,
AT ANNAPOLIS ROYAL

LOGGING WITH OXEN NEAR BEAR RIVER, NOVA SCOTIA

Using Farm Woodlands Without Abuse

By G. R. Tillotson, U. S. Forest Service

Farm woodlands are to-day being drawn upon for large quantities of timber for war purposes.

Farm woodlands are also furnishing perhaps double the ordinary amount of wood for fuel. This increased demand may result in considerable and lasting damage to the woodlands unless certain precautions are taken. On the other hand, the cutting of cordwood affords each owner of woodland an opportunity to clear his land and put his timber in better condition. To accomplish this the idea to keep in mind is to remove for cordwood the poorer, less valuable trees, leaving the better ones to stand. In removing the fuel wood the greatest precaution should be taken not to injure the more valuable trees or the young growth. Briefly, the material which should be removed is as follows:

1. Sound sticks lying on the ground. This will include tops which have been left in logging operations, and trees which have been blown over by the wind, crushed down by snow, or otherwise toppled over. If left on the ground these tops and trees are a serious fire menace, will eventually rot, and are then of no value for any purpose.

2. Dead trees which are sound and still standing. They are usually dry, make good firewood, and are of no account in the woods.

3. Trees which are diseased, or are so seriously injured by insects that they will probably die; and also trees which are specially subject to serious disease or insect attack. By cutting them out the spread of the disease or insects may be checked.

4. Crooked trees which are crowding out straight ones. The former will not become valuable timber trees while the latter may.

5. Large old trees unsuitable for lumber, and having big tops which shade out numerous smaller trees growing beneath them.

6. Small trees which are overtopped and stunted by larger and better ones. The former are not likely to develop into trees of any value.

7. Trees of the less valuable kind which are crowding good trees of the more valuable kinds. Thus a black oak or a beech which is crowding out a white oak or a hard maple of equal size and health should be removed.

8. Trees which by some chance are growing on ground unsuited to them. They will not grow into valuable lumber trees. Thus a yellow poplar on a dry ridge should be cut out in preference to a hickory, an oak, or a pine in its locality.

9. Slowly growing trees which are crowding out equally valuable kinds that grow faster. Thus a white oak, hickory, or sugar maple should be removed in preference to a yellow poplar, black walnut, or ash.

10. Trees badly fire-scarred at the butt. These are of less value for lumber than sound trees. They usually become rotten, and are among the first to be blown over by heavy winds.

11. The ideal trees for cordwood are those which range from 4 to about 10 inches in diameter. The yield of cordwood from trees smaller than 4 inches in diameter is very slight, and trees larger than 10 inches in diameter are usually more valuable for some other purpose, unless they are defective.

Trees

By Joyce Kilmer

(*A. E. F.; Killed in France*)

I think that I shall never see
A poem lovely as a tree.
A tree whose hungry mouth is pressed
Against the earth's sweet flowing breast;
A tree that looks at God all day
And lifts her leafy arms to pray;
A tree that may in summer wear
A nest of Robins in her hair;
Upon whose bosom snow has lain;
Who intimately lives with rain.
Poems are made by fools like me,
But only God can make a tree.

Winter Injury to Trees 1917-18

By W. T. Macoun, Dominion Horticulturist

Most Damaging Season Since 1903-4. Too Much Tree Moisture Lost to Permit Recovery

The severe winter of 1917-18 caused the death of many native trees in Canada and exotic trees and shrubs, including tree fruits, suffered badly. Not since the winter of 1903-4 has there been such injury to trees in Eastern Canada. The winters of 1903-4 and 1917-18 were very much alike in that the temperature rose above freezing on very few days, and there was little thawing in Eastern Ontario and Quebec, where most of the injury occurred, for nearly four months. During the winter of 1903-4 the temperature was below zero, Fahr., on 58 different days at Ottawa, while last winter it was below zero on 57 different days. The lowest the temperature went at Ottawa in 1903-4 was 30.2 degrees F., below zero, and the lowest in 1917-18, 31 degrees below. The character of the winter at Ottawa is given as an example of what occurred in other parts of Ontario and Quebec, the temperatures being much lower in some places than they were at Ottawa.

Forms of Frost Injury.

In the bulletin called, "The Apple in Canada," by the writer, thirteen forms of frost injury are described, namely, 1. Root-killing; 2. Bark-splitting; 3. Trunk-splitting; 4. Sunscald; 5. Crotch Injury; 6. Killing Back; 7. Black Heart; 8. Discolouration of Sap Wood; 9. Trunk or Body Injury, Including Killing of the Branches; 10. Killing of Dormant Buds; 11. Winter Killing of Swollen Buds; 12. Frost Injury to Flowers; 13. Russeting of Fruit Due to Frost.

The winter killing in 1917 was mainly due to Trunk or Body Injury, including killing of the branches, although some of the other forms of injury were found also. The trees matured their wood well in the autumn of 1917.

In the writer's opinion, the reason why so many trees were killed is that, owing to the long continued

cold weather without thaws or moist air, the trees steadily lost moisture until they lost too much to recover. The fact that trees lose moisture in winter has been proved by analysis of twigs. Sudden low drops in temperature may also have caused part of the injury.

Reports were received of Sugar Maples being killed in the province of Quebec and other native trees, including White Pine, being injured or killed. In some cases the leaves of the pines were killed but the buds remained alive and new leaves developed.

At the Experimental Farm, Ottawa, trees native of South Western Ontario, such as, Sweet Chestnut, Tulip Tree, certain species of Oak and Honey Locust were killed or badly injured, and, among pines, the Bull Pine of British Columbia suffered considerably. Among exotic trees, the Oak, Elm, Ash and Horse Chestnut were among those badly injured.

Hardy Apple Trees Died.

It was noticed, among apple trees particularly, at Ottawa, that some of the hardiest varieties were killed. In most, if not all of such cases, the trees had made little growth the previous year, or had borne a large crop of fruit, with the result, in our judgment, that they were very low in sap when winter set in. Other less hardy varieties, which were killed, had made good growth the previous year. In many cases the trunk and lower parts of the main branches were the parts killed, the younger branches remaining alive until there was no sap to support them.

Logging Engineering and Forestry Practice

By Dr. Judson F. Clark, Vancouver

Until such time as lumber prices substantially and permanently advance, the main hope of bettering forest finances and thereby widening the field where forestry may be practised, rests in the lowering of the costs of marketing the forest crop.

Logging engineering is at present our best hope for the larger stumpage returns so necessary for the extension of forestry methods. In the past it has been developed almost entirely by practical men who have had but limited opportunity to know and see what the other fellow was doing. For the future, the forest schools should become clearing houses for information discovered and better methods developed all along the line and thus become at once the source of supply for our specialists anf the training ground for our every-day foremen loggers.

Switzerland's Forests Worth £58,000,000

The value of the Swiss forests, calculated on a 3% yield, is over £58,000,000, or about the total of the debt for the federal railways at the end of 1915, whereas there are only 200 officials to administer the public forests, which have a minimum value of over £26,000,000.

MUCH B. C. SPRUCE LEFT.

In response to the fears expressed that the large amount of spruce being cut for the Imperial Munitions Board for aeroplane construction would deplete the spruce forests of Northern British Columbia, it is authoritatively stated by the Department that at the present high rate there is enough spruce in the limits now being worked to last for two years, andthat there is not the least doubt that very considerable stands of suitable timber can be located to provide an even larger output if necessary.—Vancouver "Industrial Progress."

The Forest Policy of France

We have now been virtually nine months in the advance section," writes First Lieutenant Lawrence R. McCoy of the 20th Engineers (Forest) "and on account of the variety of landscape, we find all species of timber and many odd operating conditions. Some of our operations are in a mountainous country in excellent fir and spruce forests that have been carefully guarded and are forested by selective cutting, and if necessary by seeding, these war times and it is very surprising to us to find that this conservative French forestry policy is virtually unchanged in national and communal forests up to within five miles of the front line trenches. As a result of this far-sighted policy we have been able to cut as high as 55,000 feet of fir and spruce timber per acre on some small tracts of 40 to 50 acres in extent although of course the general average throughout our operations will not run as high as this. In the flat country we are operating in several excellent hardwood forests, some of the old oak timber running 50 inches on the butt. One can imagine the difficulties in attempting to saw such large timber into heavy 32-foot construction timbers on a sawmill carriage built to open only 30 inches. A large percentage of the timber, however, runs only 18 to 20 inches, which easily works up into railroad ties and light structural lumber. These hardwood forests are generally divided up into several small coupes of from 12 to 25 acres each, having an annual rotation of from 25 to 30 years. About one-third of the reserve of large trees will be cut on a coupe and all of the coppice, or brush, cut out for fuelwood, leaving possibly 75 baliveaux or small trees out of the coppice per acre. The roots, when properly cut level with the ground, send up strong sprouts which in 20 to 25 years develop into a very heavy mass of underbrush which produces good fuelwood, and the baliveaux eventually mature into good saw timber. On account of this selective cutting, we find very few defects in either soft or hardwood timber and the timber is bought on a solid cubic meter volume basis. Of course there are many exceptions to the above, and in some pine forests in particular, that are hand planted, the cutting is complete and not on a selective basis.

A Scheme to Afforest the Prairies

By Thomas Tod, Russell, Manitoba

The suggestion I have to make is, that in sparsely wooded and unwooded districts, the requirements to obtain the patent for a homestead be changed from the 15 acres cultivation or other present improvements required, to the thorough cultivation and **SOWING WITH TREE SEEDS,** a strip 100 feet wide on two sides of the settler's holding. The amount of land this strip would take up would be a fraction over 12 acres on 2 sides of a section. Any quick growing variety of the seed would do, Poplars, Maples, Willows, some of the conifers and hardwoods might be tried, according to locality. That such a scheme is practicable I have ample proof, both in the case of land treated as proposed, cultivated and sown with tree seeds, of which I know several most successful cases, and also in the case of self sown poplar bluffs after fires. There are many localities in this district that have been entirely denuded of wood by fires that are now covered with self sown timber of from 6 to 8 inches in diameter, grown within the last 15 or 20 years. These facts which can

be amply and undeniably corroborated, remove the suggestion from the realm of pure theory. What are likely to be the effects of such a scheme if carried out on a large scale? It would certainly, in the long run, improve the climate, and increase the rainfall, and have a tendency to conserve the moisture. It would afford shelter to the individual settler and his stock. It would in time modify, if not abolish blizzards. It would ultimately help the settler as to timber, fencing material and firewood. Game and the wild fruits are almost certain to largely increase, and if the larger fruits, as apples, etc., are ever generally grown, it is only likely to be under some such conditions. It would make travelling along the sheltered roads a pleasure, instead of the terrible ordeal it at present must be on these bleak treeless plains, and I believe might ultimately eradicate summer frosts. My nearly thirty years experience in this country, forces the conclusion upon me that the places where grain is least affected by frost are either on a southern slope or have timber on the north or east of them. Any abandoned or unoccupied homestead so treated would not be simply a curse of a weed bed, as is now the case, but would be a much appreciated legacy handed down to the next occupant. These are some of the benefits that would likely follow the adoption of such a proposition. And I would leave it to the imagination of those who know the country, what its general effect would be in, say twenty years. What would it cost? Pass the law. Make it compulsory. The divisional surveyor's field books would show where exemptions from it might be granted. Let the Government furnish the seed and employ homestead inspectors to see its terms carried out. The Indians and school children could be enlisted under direction. As to the seed, the demand would soon create the supply. In some seasons tons of it could be gathered in Manitoba and doubtless in some parts of Saskatchewan and Alberta. As to fire protection: For some time the cultivated strips would act as fire guards and afterwards no sane man would leave such a valuable assets as twelve acres of live wood without protection. Railway lands and lands held by speculators would have to be dealt with separately But it is clear they would fall behind in value in the market in competition with land with wood on it. Still these lands would derive a substantial benefit from the shelter and general amelioration of the district through the homesteaders' work, and if kept persistantly unforested might be made to pay a higher ratio of taxation for the unearned increasement. All lands so forested could be made free of taxation as long as they remained so. In closing I would point out that the adoption of the above scheme does not necessarily interfere with the settler's cultivation of his land for cropping purposes, but that the delay in fulfilling the law would result in the like delay in the granting of his patent.

THOS. TOD.

Campers Arrested 100 Miles From Fire

San Francisco, Cal.—The vigilance of the forest service as well as the relentless manner in which they follow up those who, through negligence or other reasons, endanger a community to the ravages of conflagrations is exemplified by a recent case.

Two men left their camp fire burning. Although the smoke was almost immediately detected by the forest fire lookouts, it was supposed that the county supervisor was burning drift and other debris. It was found that a camp fire had been left burning and had burned into the surrounding forest, threatening to destroy not only the timber, but also the county bridge. Also it was learned that the two men had left the fire burning and after certain evidence

had been secured efforts were made to locate them.

Five days later one of the men was arrested more then 100 miles from the scene of the fire. Two days subsequently the second man was apprehended. They will be tried for leaving a camp fire unextinguished.

Forestry and Apple Growing

By the Editor of the Toronto "Globe"

When most of one's life time is spent in the same locality changes which go on from year to year, and in the course of time become almost revolutionary, pass almost unnoticed. When another, after an absence of 30 years, returns to the same locality, the extent of the changes which have taken place is observed at once, and the possible effects of these naturally become a subject of enquiry.

Mr. W. H. Belford of The Winnipeg Free Press, recently visited his old home in Northumberland county for the first time, in summer, since 1888, and to him some things that have taken place in the time stated caused both astonishment and regret. Orchards which were bent to the ground with apples in the autumns of his boyhood he found bearing exceedingly light crops this year. To him the statement that this was due to the peculiarly trying conditions of last winter did not furnish a sufficient explanation of the difference in yields between now and then. In his view the cause of this difference is found in the fact that a country once well wooded is now almost bereft of forest trees and that a free sweep has thus been given to the cold, dry winds of winter.

Other causes than the one mentioned by Mr. Belford have, however, been at work. Scarcity of help and uncertainty as to markets have led to neglect of the sparying, pruning and cultivation now necessary to the production of apples in this Province. Still there is no doubt as to the evil effects on the apple growing industry due to the unwise cutting of forest timber that has taken place. The removal of nature's protection has subjected orchards that were well cared for to climatic conditions which even these could not resist. The severity of these conditions has not only reduced the apple crop of this year, but it has so weakened or wholly destroyed thousands of trees that a shortage in fruit is bound to be experienced for years to come.

The condition of Ontario orchards in 1918 affords one more reason, and an exceedingly cogent reason, for the adoption of a reafforestation policy in Ontario.

New Use of Birch for Paper Making

Important Experiments May Prove Great Boon to Spruce and Balsam Forests

The most serious obstacle to the proper handling of the mixed forests of eastern Canada has been the lack of utilization of the hardwood species, particularly birch. This has been especially true as to mixed forest lands held as pulpwood limits, where, over vast areas, the coniferous species comprise only from 25 per cent. to 50 per cent. of the stand, the balance being hardwoods. The cutting of the conifers, particularly spruce and balsam, has a constant tendency to convert the stand into a hardwood forest, partly because of the actual reduction in numbers of the conifers, while the hardwoods are left standing; and partly because the coniferous seedlings are prevented from making adequate growth, on account of the dense overhead shade of the hardwoods, which spread out and close in the spaces made by the removal of the conifers.

Effect of Cutting Birch.

If the hardwoods, particularly birch, could be used to commerical advantage, their removal would permit spruce and balsam seedlings to come in much more satisfactorily and to make a much better rate of growth, on the average, instead of so many remaining suppressed for a long period of time.

The primary reason why the hardwoods have not been utilized in most of our northern forests has been the difficulty of transportation, in the absence of railways. Hardwoods are too heavy to be driven long distances in streams, without very severe loss by sinkage; and besides, the amount of flood water in the majority of driving streams is hardly adequate in volume to float the spruce and balsam to their destination, to say nothing of carying large quantities of birch in addition. As a consequence, birch has remained practically a weed tree over enormous areas of our eastern forests where there is no rail transportation.

At last, however, there is a possibility that the problems of transportation may be at least partially solved through the winter use of motor tractors for log-hauling on iced roads. This would apply not only to hardwoods but to coniferous species as well, where, in the case of long drives, the loss by sinkage is serious, especially as to the smaller sizes, and more particularly in the case of balsam. Several concerns are experimenting, or are preparing to experiment, along these lines, the River Ouelle Pulp and Lumber Company being the pioneer in this direction as to eastern Canada. The Laurentide Company, Limited, has this year purchased some lighter tractors of the caterpillar type and will this winter experiment under conditions in the St. Maurice Valley. The use of tractors for log hauling is already established in parts of British Columbia and in various sections of the United States.

New Market for Birch.

The second obstacle to the removal of the hardwoods in our northern mixed forests has been lack of a suitable market, particularly by the pulp and paper companies, which hold rapidly increasing areas af such lands. Formerly, only spruce was accepted for use as groundwood in the manufacture of newsprint; later, balsam was accepted in an increasing proportion, and now both species are used practically without discrimination. It has always been considered impracticable, however, to use birch or other hardwoods acceptably for groundwood. The Forestry Department of the Laurentide Company has, however, for a long time urged that experiments be made with a view to the utilization of birch in the manufacture of newsprint, and an experiment was recently made by the Company which

appears to give excellent promise of satisfactory developments along this line. A test run was made, the results of which indicate that up to ten per cent. of birch groundwood can be used to excellent advantage in mixture with spruce and balsam groundwood in the manufacture of newsprint.

Great Boon to Conifers.

It is expected that further tests will be made, in collaboration with the Dominion Forest Products Laboratories. Should the final results be satisfactory, and should the use of tractors solve the problem of transportation to any material extent, a new era will be opened up in the intelligent handling of our vast areas of mixed forests. It will then be possible to utilize large quantities of birch, in the manufacture of newsprint, thus materially relieving the increasing drain upon spruce and balsam, and at the same time leaving the corresponding logged-over areas in good condition for future production, instead of constantly depreciating their quality as has been the tendency under the only methods of operation hitherto considered feasible. Should these developments come to pass, forestry will find an immense scope for activity in our northern forests, replacing at least in part the destructive methods so generally practiced heretofore.—*Clyde Leavitt.*

Eastern Canada and British Trade

By T. H. Blacklock

Resident Editor of Montreal Gazette, in London, England

British and Canadian timber experts believe that for several years after war, Britain, France and Belgium will have to import practically their whole requirements of pit props, railway sleepers and heavy timber and deals. The home supplies will be almost exhausted and these countries must look to Northern Europe—Norway, Sweden, Finland and Russia—or to Canada, for ordinary requirements and for reconstruction work in devasted areas. Many Canadian timber experts, now in the forestry corps and combatant ranks, believe that Canada can capture the bulk of this trade if proper and energetic effort is made. They count Russia and Finland out of the market owing to present and in a great measure continued business and political disorganization. The supplies from Norway and Sweden are limited and also much of the timber business of these countries was due to Russian imports partially manufactured and exported to Britain. They also point out that for two or three years after the war Britain's timber imports will be controlled by the government, as will in a measure ocean transportation facilities for this purpose.

Pit Props 700% Higher.

Pit props are selling here at present at twelve cents per foot for props three inches at the top. This is about seven times the price in pre-war times, and although it will decrease as conditions make for normal, yet for years it will be remunerative. The demand in Britain for pit props is enormous. For sixteen mines near Doncaster the yearly requirements are about 32,000,000 and this area is only one of many throughout South Scotland and the Midlands. Railway sleepers will be required by the million and heavy timber to the extent of the entire requirements.

Look to Quebec and N. B.

Canadian hardwood with the exception of birch, will find but a limited market, as Britain's local supply has not been seriously impaired and her imports will be drawn from the East and Central and South America. Many are looking to Quebec and New Brunswick as the

field to meet the British, French and Belgian demands for pit props, sleepers and heavy timber, and believe that Canada's sailing ships now under construction will solve the transportation problem. They claim that we must produce to meet European requirements not according to our own ideas, and failure to do this in the past has been our greatest handicap in developing trade. South Africa is another market for Canadian timber. There can be no question of the enormous requirements for Britain, France and Belgium after the war; the only question is whether this trade can be captured for Canada. Canadians here believe it can and are preparing to make the attempt.

T. H. Blacklock.

The New Birth of Forestry

By Dr. Filibert Roth, Ann Arbor, Michigan

Science of Forest Management Brought Into Limelight by Wa'rs Exigencies---A Brief History

Forestry is entering a new phase; it is leaving the era of propaganda and entering one of business. It is leaving a period when a very small number of good people, mostly not owners of forest and without material interest in forest—advocated the practice of forestry, and they did this at a time when billions of feet of timber were without market value and when millions of feet of timber were, of necessity, unused and decaying in our woods, and when the men in charge of public affairs, quite generally, could see no use in any special public efforts, and the owners of timber were still finding it much harder to sell than to buy.

In Europe, forestry developed out of necessity; it started in the days of Charlemagne and took 1,000 years to grow into a science, an art and a business. Its entire development came before the advent of the railway; it came in a time when it was impracticable to haul timber overland, even for a short distance of 20 miles, and when as early as the year 1400 it was difficult in some localities to get building timber, while not 100 miles away millions of feet were without any market value.

In our country, forestry came, ready made, from Europe. Its introduction really came after the year 1870; it came long after the railway had become a success and was rapidly extending over the land. In our country it was not the village, town and the State which was in danger of real timber—and even fuel—famine which saw itself driven to forestry by necessity, but, as stated before, it was a handful of far-seeing, well-meaning people who had become apprehensive and felt it their duty to call attention to the rapid destruction of the forest and the utter lack of any effort at its replacement.

France Since 1420.

As early as 1420, France had a state forest law of 76 articles and a state forest organization. At that time, even the written compilation of village and town laws, including forest laws of Central Europe, were over 100 years old. All public authorities, village, city and the multitudinal forms of autocratic authorities, by this time realized clearly that the forest was entirely different from the field; that timber and fuel land and care and a long period of were necessities; that it require time to grow timber; that it was hopeless to leave it to individual likes and dislikes, and that it was necessary for public authority to step in and use its authority and exercise its providential functions. The policies were promptly expressed in law; and the laws were in keeping with the times, simple and direct. Clearing of forest was forbidden;

likewise forest devastation; utilization was regulated, and the protection of forest received special attention. And all this, not because of any propaganda, but simply because the people, the owners of the woods and the users of wood realized the necessity of prompt and forceful action. But even so, forestry required a long time to grow, and Colbert, the great minister of France, two centuries later expressed himself in the famous sentence: "France will perish for lack of timber." He did not stop at this, however, but worked out his still more famous forest law of 1669, remarkable for being most complete and effective. Corrupt practice under the Bourbons led the Revolution to repeal parts of this famous law, but in 1801 and 1803, and finally in 1827, it was re-enacted, forms today, and is likely to form for a long time to come, the great guide and director of forestry in France.

The War's Demands.

Then came the war.

Before the end of 1916, it became very evident that even in this latest and greatest of wars it takes timber; that forests protect armies; that timber in enormous quantities is needed at the front, in the trenches, for shelters, covers, for roads and bridges, for barracks and hospitals; that much of our equipment needs wood of special kinds, and that even the flying machines require a propeller and frame of well selected and seasoned wood. It became evident that Germany's ability to hold out was in no small degree connected with her forests, and, for the first time it was brought home to our people that forestry differed from the field; that while in farm crops, of bread and meat, we live hand to mouth; in the forest crops, if properly cared for, as in Germany and France, we have 20 year's living ahead. Then came shipping difficulties, and by the beginning of this year Sir John Stirling-Maxwell, in England, made the statement in a public address:

"For the last three years every one engaged in the organizations for war has known how dearly this country (England) is paying for the neglect of a great national industry (forestry).....The Prime Minister has told us that timber absorbs more shipping than any other import, and that we can only insure imports of food by foregoing imports of timber. .....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* .....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 40 million (pounds sterling) more than we need have paid for home-grown timber."

The Forestry Sub-Committee of the British Reconstruction Committee states: "There appears to be no reason why the Canadian forests should not supply the United Kingdom with coniferous timber and meet its growing needs for many generations." "*Meanwhile the forest capital of Canada is growing less year by year. This we submit is an Imperial question of the first magnitude which deserves the immediate attention of the Imperial and Dominion Governments.*" The Committee then recommends spending $60,000,000 in a planting program of 40 years for the small area of waste lands, in the British Isles.

Here we have a small island country, close and convenient to large supplies of timber, suddenly waked up to the necessity of supplies of timber at home.

When our country entered the war, naturally everyone felt, that at least we would not have any trouble in getting timber.

But we had a great surprise in store. Everything of value was bought up and shipped. "This is my third trip here and I just closed a deal for a large lot of lumber which I refused to take on my last round," said the English buyer to one of our men. We needed ship timber; we needed everything clear up to seasoned mahogany, oak and walnut for

propellers for aeroplanes and spruce for their frames. We were fortunate in having it, at least as standing timber, in the woods. But it meant the creation of a separate army of men to cut and deliver spruce, to inspect, to dry kiln, as well as to manufacture wood for war purposes.

At last a new era has come. *Necessity* is stepping in and teaching the lesson in forestry to our people. She does it in her usual way; there is no argument; the shouter of substitutes; the wiseacre who would import our 40 billions from Alaska, where there is but a fringe of timber, and from Siberia, where there is less,—all the "*fs*" and "*cants*" take a back seat. Our people suddenly know that timber is a necessity; that we need lots of it and need it close at home, and that it takes land and a 100 years to grow. The "Timberman" of Portland, Oregon, says: "The lumbermen of the Forest Service should get together and work some definite plan for the perpetuation of our timber supply on some scientific and workable basis. The Government is interested primarily in the available supply of timber for the Nation's use." It adds: "*The growing of timber is a national function, it is not the business of an individual.*" Dr. Fernow may well ask in the Canadian Forestry Journal: "Has the public opinion yet been convinced that forest maintenance is a State Business?" At last forestry, as a simple and useful industry, stands on its own merits. Whether our efforts will be chiefly National, and State, or whether we shall depend on private efforts is important but not vital; probably we shall utilize all and welcome all. But the lessons of Europe ought not to be lost, State forestry is the best and safest form, it does more and does it better. The least dependable is the small holder, where the son cuts down what the father has built up, and where all conditions seem to operate against the holding of the forest. Generally, encouragement laws have done but very little; coercive legislation, as tried in Europe, has done but little better, and universally the replacement of private effort by State action has proven most satisfactory from every standpoint. We are now ready for a large program in forestry in the United States; the outlook is of the best, and perhaps the most urgent and immediate need is for a goodly army of men, schooled and trained to make the plans and carry them into effect. Our country needs 500,000,000 acres of well cared-for and well regulated forest; it needs woodlots scattered through the greater part of our farm district, but to have this it needs also 100 well schooled men to every million acres of woods if they are to receive the care they need. The forests are calling, the people's interest demand it, let us help and make the task worth while for our young men to build up the American forest.

Great Work of Overseas Forest Corps

The production of the Canadian Forestry Corps in France has been steadily increasing, and, from a total of 11,500 tons in March, 1917, made up of 5,500 tons of sawn material 3,500 tons of round and 2,500 tons of fuel, it has steadily grown until in May of this year it had almost reached a total of 150,000 tons, made up of 90,000 tons of sawn lumber 10,000 tons of round timber, and 50,000 tons of fuel. During this same period the strength of the Corps increased; rising from a total of slightly over 2,000 in March, 1917, to a total of just under 13,500 at the end of May, 1918.

When the work was taken over by the present Directorate, there were approximately seven mills being operated by ten Canadian Companies, whereas, at the present time, there are fifty-one saw mills and two resaw plants being operated by fifty-

eight Companies, in addition to which two other Companies are specially employed on aerodrome construction work with the Independent Force, R. A. F. Another interesting fact illustrating the growth of the Corps is that the production for the first six months of the present year was practically 50% in excess of the production for the whole twelve months of 1917.

During the first six months of this year, over 183,000,000 feet of sawn product have been produced, and, if approximate comparative values are given to the quantities of sawn lumber, round timber, and fuel produced, the value of the sawn lumber is almost 85% of the total value of the products of the Corps. At the present time, sawn lumber is being produced at the rate of over 1,400,000 feet per day and in order to meet the heavy demands of the Armies for standing gauge and other sleepers in connection with their railway construction programmes over 350,000 sleepers are being produced each week.

Using the Oak Forests.

The main sources of supply of standing timber for this sleeper production are the oak forests of Normandy and Central France, and the immense pine areas of the "Landes," south of Bordeaux. This latter area comprises over 2,000,000 acres of almost flat sand lands, which have been planted with Maritime pine since the end of the 18th century. One of the main sources of supply of sawn timber, in addition to the sources mentioned previously, is the large fir and spruce forests in the mountains of the east of France, in the Department of the Vosges, Doubs and Jura, which are being largely operated by the Canadian Forestry Corps for the French Army. The forests in the former of these Departments are mainly located in mountainous country presenting many difficulties from a lumberman's point of view, and in one case the timber has to be lowered by cable to the mill from a slope of over forty-five degrees.

Logging by Rail

In most of the operations of the Corps, the logs are transported from the stump to the mill by railroad, since climatic and natural conditions do not permit of adopting the usual Eastern Canadian methods of winter hauling over snow or ice roads, and floating by river or lake from the forest to the mill. About ninety miles of railroad are now in use, including short spurs of standard gauge, and long stretches of one metre, three-foot and two-foot gauge track. The cars which are operated by these narrow-gauge railwoads have been mainly built by the Corps and various means of traction are employed, including steam locomotion, petrol tractors and horses. In this connection General Stuart points with pride to a petrol locomotive built by his men in No. 2 District Machine Shop within eight weeks time. The engine is from an evacuated Jeffery truck, the differential from a captured Mulhausen (German) truck, and the remainder of the parts from scrap material of all kinds gathered from the dumps, adapted and utilized for the purpose. To prove its efficiency I need only add, that, at the first test, it hauled a load of trucks approximating twenty-one tons.

Lieut. H. R. Christie, who was formerly a member of the head office staff in the British Columbia Forest Branch, in charge of the Department of Operation, has just returned from overseas. He enlisted in one of the field companies of civil engineers and has seen nearly three years service, was slightly wounded, and received the Military Cross. He is at present on his way to join the Canadian Expeditionary Force to Siberia. He was one of Dr. Fernow's graduates.

The cost of fighting fires in the three eastern associations of Quebec, the St. Maurice, the Laurentide and Southern St. Lawrence, has only been $2,000 in 1918, as against $15,000 years ago. This is a remarkably good showing.

A New Forest Insect Enemy of the White Birch

By J. M. Swaine

Chief, Division of Forest Insects, Entomological Branch, Ottawa

A new and highly destructive enemy of the white birch was discovered by us this summer in Quebec Province, and serious injury from probably the same cause has just been reported from another locality.

In the region examined by us the disease was evidenced by many dead white birches, visible in every direction, indicating that the outbreak had been in progress for at least several years. Of the living trees probably over 50% are already badly diseased, and show the characteristic dying branches in the upper part of the crown.

Nature of the Injury.

The injury is caused by a small bronze-black beetle, known as the Bronze Birch Borer, *Agrilus anxius*. The eggs are laid in the bark during June and July. The larvae or grubs excavate long winding tunnels through the inner bark and sapwood of both branches and trunk, and since the mines are frequently very numerous, the sap-flow is checked and the affected portion of the tree may succumb very rapidly. The winter is passed in the larval stage in cells situated in the outer part of the sapwood, and the adult beetles, having developed from the larvae during the following spring, bore half-round holes through the bark and leave the tree chiefly during June and July.

Injured living trees show dying upper branches; when these dead or dying limbs are peeled, the characteristic winding tunnels of the larvae on the surface of the sapwood often form a tangled network.

Extent of the Injury.

We do not yet know how widely the injury is distributed through out the Province, but it is probably of more than local importance. It appears to be spreading rapidly in the section examined; about 50% of the white birches are badly injured and the remaining healthy trees will apparently be attacked within the next few years.

The Bronze Birch Borer has long been known as the most serious

enemy of cultivated birches in the Ottawa Valley and other parts of Eastern America; but, although we have found it breeding in small numbers in wild birches, this is the first instance known to us where it has developed into a really serious forest pest. It is interesting that an enemy

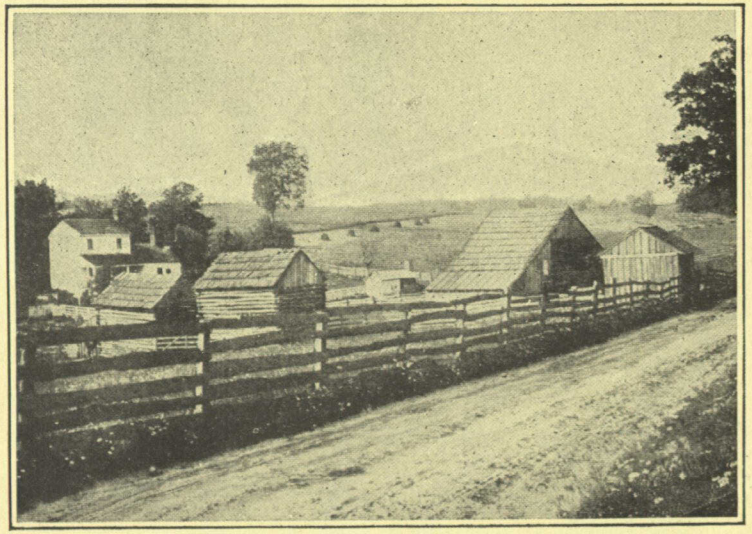
Indian River Drivers in an exhibition stunt at a Canadian summer resort, riding the log half way across the bay.

Picking out a log jam in a Northern Quebec river.

Scene in Rock[illegible]e Park Ottawa

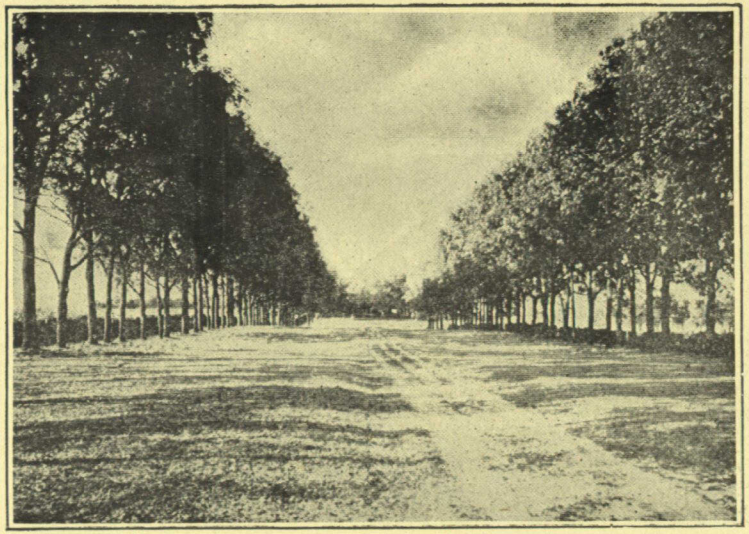
Along the Driveway, Rockliffe, Ottawa

"Royal Shanty," Rockliffe Park, Ottawa



A Common Way of Approaching the Farm

To reach this farmhouse you must drive past a pigsty, corn crib, hen-house, manure pile, and clutter of farm tools. A bad approach gives a bad impression.



The Right Way of Approaching a Farmhouse.

The approach to this farm, is a double row of Black Walnut trees. half a century old, lining a drive an eighth of a mile long. The trees have not required more than one day's work a year for one man. Considering merely their value as timber, these trees show a profit of 1,000 per cent.

of this kind should appear coincident with the perfection of methods for utilizing birch in the manufacture of pulp.

Control Measures.

The Bronze Birch Borer passes the winter as a larva or grub in the sapwood of the infested trees, and it is conceivable that if all or nearly all the infested trees were marked while the leaves were on, removed during winter, and utilized before June in such a way that the contained grubs would be killed, the remaining healthy trees would have a fair chance for life. This method of control is perfectly feasible on small areas and should certainly be carried out wherever small holdings become infested but it is obviously impracticable on a large scale under the present conditions of logging birch. There appears to be no other method of checking the spread of the disease. The only recommendation we feel justified in making in this connection is that, since the white birch in a badly infested district are apparently threatened with destruction within a few years, the white birch should be removed and utilized as rapidly as is commercially profitable. The Yellow Birch is not so seriously affected.

The High Mortality of Balsam Fir

By Dr. C. D. Howe

At Meeting of Woodlands Section, Canadian Pulp and Paper Association

My studies have been restricted to the mixed forests of the hardwood and softwood type, in which the hard wood may form anywhere from fifty to seventy-five per cent. of the stand. So far as the overhead is concerned, the hardwoods are the dominant trees.

You know that it was in these mixed forests that you first began to cut spruce, taking only the largest trees. You perhaps went over these areas twice, cutting spruce saw-logs, and taking away the best spruce and taking away the last time you went over it, fifteen or sixteen years ago, or less, as the case may be, all the spruce down to the twelve inch diameter limit. You see the effect of that. Cutting the spruce successively and leaving the balsam, you constantly made conditions worse for the spruce and better for the balsam. Up to about ten years ago, you did not look at balsam. Balsam was left there and the opening that you made in the crown-cover encouraged its reproduction. Then later you cut out both the spruce and the balsam and that stimulated the growth of hardwoods, and the hardwoods grew up, filled in the spaces formerly occupied by the softwoods, and thus you converted a mixed forest into a hardwood forest; first by cutting the spruce you gave the advantage to the balsam, and in the past few years you have been cutting a great deal more thoroughly, and you have opened up the crown-cover more, and there again you made conditions very favorable to the balsam reproduction, more so than to the spruce. You go through the forests of the Riordon limits, and the Laurentide limits, and you will be impressed by the abundance of balsam reproduction. You will go through thicket after thicket of balsam, anf if you see a spruce tree, it will be a little bit of a suppressed fellow, under the edge of the balsam thicket, or under the hardwoods.

Balsam versus Spruce.

Now, this summer up on the Croche River, I found *the reproduction was ninety-seven per cent. balsam, and three per cent. spruce, where the cutting had been chiefly spruce*, until a few years ago when the balsam was also cut. Lower down in the St. Maurice Valley, on areas cut over twice for spruce and once for both spruce and balsam, was seventy-five or eighty per cent balsam.

There would be nothing to worry about if we could use balsam, and we could, if it was not for one thing, and that is, the liability of balsam to disease, As you know, this balsam is fearfully diseased. There is a fungus growing on it; there is the heart rot inside of the wood, and inside the bark the beetles are working, girdling the trees. I found in the St. Maurice Valley four thousand balsam seedlings to the acre in this cutover land; when that balsam got to be 8 inches diameter the average was twelve trees to the acre, and seventy-five per cent of them were diseased This high rate of mortality is probably chiefly due to insect and fungus diseases.

150 *Years to Grow Spruce.*

Now, if conditions like that prevailed in other regions in Quebec, we could not rely on it, even if we could make paper entirely of balsam pulp—we could not rely on the balsam supply.

There are plenty of young spruce trees in these mixed forests—little suppressed fellows, but they grow with great slowness. It takes, in these mixed forests, fifty to seventy years to make a spruce tree a little larger than my finger—an inch in diameter, and on the average it will take from one hundred and fifty to two hundred years to make a spruce tree twelve inches in diameter, at the present rate of growth.

That is the condition in the mixed forests, where we have a cover of hardwoods. You may think you are going back there and cut a good crop of spruce. I don't think you are going to cut it at all. The next spruce supply you can cut will not be inside of one hundred and fifty years, if you wait for the present young growth to mature. You are not going to cut much balsam, because it is dying so rapidly, so what are you going to do? What can you do? I would be very glad for some suggestions.

Travelling Lecture Sets in the West

Ready-prepared Illustrated Addresses Now Available to Manitoba, Saskatchewan, Alberta and B. C. Speakers

In response to many requests from Western members, the Canadian Forestry Association is establishing at Winnipeg, Prince Albert, Calgary Kamloops, and Victoria, five Travelling Lecture Sets for the use of public speakers, school teachers and others desiring to hold meetings for adults or children. So successful have these Travelling Lecture Sets proved in Eastern Canada that benefits quite as notable are bound to ensue from their wider employment in the Prairie Provinces and British Columbia.

Each Set consists of from fifty to sixty lantern slides, mostly in colors, and a complete manuscript, bound in boards, all in a break-proof box. The slides are numbered and correspond to descriptive paragraphs furnished with the lecture manuscript. Scores of school principals, clergymen, etc., have found these Lectures most entertaining and instructive. They have been made quite non-technical, although clearly bringing before the audience the essential points of forest protection and the science of forestry.

By courtesy of the Dominion Forestry Branch and the Provincial Forester of British Columbia the Sets will be established in the government offices so that application may be made direct to the District Inspector of Forest Reserves at Winnipeg, Prince Albert, Calgary and Kamloops, and to the Provincial Forester, Victoria, B.C. for the use of one of these Sets. There is no charge whatever in connection with these Travelling Lectures, except for the small expressage fee necessary to take the Set to and from engagements. Those of our Western members possessing a stereoptican and desiring the use of these Sets between receipt of this Forestry Journal and January 1, 1919, should write direct to the Secretary, Canadian Forestry Association, Booth Building, Ottawa, and after that date to the addresses given above.

Forest Protection in British Columbia

By Clyde Leavitt

Chief Forester, Commission of Conservation

British Columbia is the greatest forest province of Canada. Her forests contain approximately half of the entire stand of saw timber of the whole Dominion, and 24 per cent. of the total stand of the Pacific Northwest. On the other hand, the British Columbia lumber cut in 1913 (the last normal year before the war) was only 13 per cent. of the cut of the Pacific Northwest.

The progressive development of markets, both domestic and foreign, will unquestionably mean a very material increase in the development of the forest industries of the province. That there is ample room for this is indicated by the estimate that the forest resources of British Columbia can, under conservative exploitation, supply at least five times the present cut without seriously depleting the capital stock. The reasonableness of this estimate is at once appreciated when the average lumber cut of 1,250 million board feet is compared with the total stand of saw timber, aggregating some 350,000 million feet. If all the timber suitable for pulpwood be included the total for the province is 366,000 million feet, according to the report on the forest resources of British Columbia, by R. D. Craig and Dr. H. N. Whitford, to be issued shortly by the Commission of Conservation.

The economic importance of this situation to British Columbia and to Canada as a whole is evident when it is realized that British Columbia's forest revenue is already larger than that of any other province of the Dominion, aggregating around $2,500,000 annually, from provincial Crown timber lands alone. The manufactured value of the primary forest products of the province (such as lumber, pulp, shingles, boxes, piles, poles, mining timbers, etc.), was in 1916 $35,528,000, when the forest ranked second only to the mines in productive value. During 1917, the forest production increased to such an extent as to bring the total value in excess of the value of the mining output. What the forest would mean to British Columbia and to Canada were the total cut to be increased three, four or five-fold, without impairing the capital stock, may be left to the imagination.

Protection of Young Forest Growth.

It should, however, be noted that these results are predicated upon the basis of what is called conservative exploitation. The most essential feature of such exploitation is protection from destruction by fire, particularly the young forest growth. The report by Messrs. Craig and Whitford, previously referred to, shows that out of a total land area of the province of 353,000 square miles, some 200,000 square miles is incapable of producing forests of commercial value, because of altitude, rock or wet soil, or complete denudation by fire in times past. The actual and potential productive area of the province is thus reduced to 153,000 square miles. Of this only 28,000 square miles, (less than 20 per cent., and aggregating only 8 per cent. of the total area of the province), now bears sufficient timber to be classified under provincial law as statutory timberland. This leaves the enormous area of 125,000 square miles, upon which the stand is less than 8,000 board feet per acre on the Coast, and less than 5,000 feet per acre in the interior. A large proportion of this is land upon which the former forest has been destroyed by fire, and upon which a young forest has since established itself. The protection of this vast area of young forest is absolutely essential if British Columbia is to reap to the full the great benefits which will follow from the full utilization of the possible annual forest increment.

The Coast forests, by virtue of climate and location, are actually and potentially by far the most valuable area for area. It is here, then, that the

most careful attention is justified in connection with the young forest, actual and prospective. In 1913 Dr. C. D. Howe made for the Commission of Conservation, in co-operation with the B. C. Forest Branch, a report upon reproduction of commerical species in the southern coastal forests of British Columbia. The investigation extended over an area of about 1,000 square miles, and the report is contained in "Forest Protection in Canada, 1913-1914," published by the Commission. The report shows that on about one-half of the area logged and burned during the preceding 20 years the forest reproduction is not sufficiently abundant to ensure the re-establishment of the commerical forest. The other half, however, is well stocked with young trees, and, if not burned a forest yielding saw logs is assured. The barrenness, from the standpoint of young trees, on one-half of the logged area is, to quote the author, "due to the occurrence of repeated fires." One burning stimulates the reproduction of Douglas fir—in fact, it is regarded as necessary for the establishment of dense stands; but a second burning is very disastrous, because it kills both the seed trees and the young growth following the first fire. There is nothing left with which to start another crop of trees on the area.

Small Patrol Staff—Heavy Fire Losses.

Now for the application of the foregoing discussion.

War conditions and the financial situation have made it necesasry for the British Columbia Government to retrench severely, and in addition, enlistments have been heavy from the forest staff. Consequently, the forests. protection work has suffered severely since 1914.

The reports of the Provincial Forest Branch show that in 1914 the temporary staff of forest guards and patrolmen consisted of 391 men; in 1915 this was reduced to 218, and in 1916 to 200. The permanent staff for the same years was 167, 160 and 136, respectively. The report for 1916 states that the reductions brought the patrol staff to a number below safety, very large areas of Crown timber being left entirely without protection, only a fortunately favorable season saving the situation. The same report shows that large areas of valuable second growth were destroyed, particularly in the interior. The report for 1915 states that owing to various unavoidable circumstances fires that year were less strenuously combatted than in any other recent fire season. The fires were fought only where timber merchantable at the present time was threatened, or in cases where a large amount of property, such as cut timber and buildings were endangered. Such a policy, the report continued, is reflected in the size of the fires, these increasing as the patrol staff decreases. The conclusion is drawn that fire-fighting is efficacious and does really reduce the fire damage—a fact which should surely require not even an argument. The inevitable result of such a policy of severe retrenchment in the patrol staff and fire-fighting allotment must be that large areas of valuable young growth will be sacrificed, with consequent serious deterioration in the quality and quantity of the future forest on these lands, as already explained. The fire situation during 1917, and more particularly during the current year, demonstrates conclusively the disastrous results that may logically be anticipated from a policy of letting the young forest so largely take care of itself.

Public Sentiment and Better Fire Protection.

The serious difficulties in connection with the labor shortage and the financial situation are, of course, obvious. So far, however, as the latter is concerned, it is believed that the Provincial Government could well afford to set aside for forest protection a materially larger proportion of the very handsome forest revenue that is being derived, even though it were necessary to raise the rate of taxation to meet the deficit in the amount available for purposes of general governmental administration. The policy that it has been deemed necessary to pursue during at least the past four years means the

sacrifice of a very great future benefit in order to bring about a very much smaller present saving. The Government, however, is dependent for its appropriations upon the state of public sentiment. If there is an overwhelming belief on the part of the public at large that the young forests of the province must be protected, even at the cost of more severe present financial sacrifice, the Government will be able to make the necessary provision. Every citizen of the province is directly interested in this important matter.

With a Forester in a Tank Corps

Lieut. C. H. Morse, a well-known Canadian Forester is now with the Tank Corps at Wareham, Dorset, reverting in rank to secure a place. A breezy letter from his pen reads as follows:

"As you see by the heading I am now in the Tank Corps and have been in this particular camp since the middle of June. There certainly is nothing soft about our work here. It is the hardest sort of physical work and besides that it is extremely dirty. One can't stand upright in a tank, so it is very cramping. It is very hot and dusty. When we quit driving, our faces are absolutely black except for round spots around the eyes protected by goggles. After spending three or four hours in the suffocating atmosphere of a tank one is very glad to get out and get a smoke.

In spite of the disagreeable nature of the work I love it. It is fine to crawl into a tank feeling that you can go practically anywhere. We have huge areas dotted with shell holes and with trenches and wire entanglements. I've never had a machine stuck yet although they pitch about in a most alarming way. When you get a tank perched vertically on its nose or tail it makes you hold your breath as it starts to tip over. The jar isn't really so bad on ordinary soft ground when travelling slowly. When going on top speed through bad holes a man gets rather badly knocked about.

A fortune in Chestnut.

If you could only get a market for some of the "brush" along the Rockies, at what the 10-14 year old Chestnut coppice shoots sell for here, you could be blissfully regardless of whether the Ottawa estimates "went through" or not. "Twelve year sprouts" down in Kent, even before the war, had a stumpage value of $600. an acre. It is most valuable then, because possessing the greatest number of uses—chiefly for fencing, hop-poles, barrel and tank hoops, faggot-wood, etc. The capital locked up and the care required in this kind of forestry are small, but of course it's a bit hard on the land.

FOREST RESERVES ESCAPE FIRE

From the Dominion Forestry Branch "News Letter" Issued at Calgary.

Although we have had somewhat dilapidated staff it seems that we can at least congratulate ourselves on getting through so far with a very successful fire season. The Athabasca and Brazeau Reserves seem to have been pretty well favored by weather conditions all through. On the Clearwater, Bow River, Crowsnest, Cypress Hills and Lesser Slave Reserves, however, there have been very acute emergencies. As previously intimated Supervisor Doucet had numerous fires. On the Bow River, Greenwood had one bad fire to fight in the valley of the Red Deer River. This fire, however, was kept entirely outside the Reserve and was finally extinguished. On the other reserves all fires have been confined to small ones with the exception of the Cooking Lake Reserv ewhere in the spring they had numerous large grass fires.

New Ways in the Woods

By Ellwood Wilson, before Woodlands Section, Montreal

We have always regarded the forests as mines from which we could draw our timber supply. We never paid much attention to the statement made by the old-fashioned kind of cruisers, that timber lands are producing wood at the rate of three per cent. per acre per annum, and now we know that that statement is one upon which we could not rely for the future. Any cruiser who says that, stamps himself as an ignoramus at the start. They have been making reports which were absolutely absurd. I had occasion to go through a large number of these this spring, scattered from Ontario to the Labrador coast, and they were obsolutely ridiculous.

We have to get away from opinions. We have got to get away from the reports of cruisers who paddle up a river and see a certain amount of timber on the banks, guess at the amount, and then go back and make these glowing reports.

We have always regarded the forests as a mine. We have gone on year by year cutting the timber out as cheaply as we could, hoping we could go back and get another cut. We have started logging in the most accessible situations, and we have cut around the edges of lakes and along the banks of rivers and when we have been forced by lack of timber to go farther into the country we have gone. We have areas which are very expensive to log, and in order to prevent going into these areas when labor is scarce and prices high, we have tried to buy accessible timber in other sections, or to buy stumpage or wood from the farmers.

We are practically face to face with a scarcity of timber. Accessible timber is becoming quite scarce and we have to think a minute as to what we are going to do. The price of labor has reached a height which makes it very difficult to operate. The price of provisions is also away up. This has forced us into a position where we have to think about the future of our supplies. If this thing goes on year in and year out, the price of paper and lumber will go where nobody will be able to touch it. We all of us know, if we have observed closely in the woods, that the supply of wood is getting pretty scarce. We say we have gone back time and time again over the same areas, that was left in the first instance, but Dr. Howe's report, shows that instead of going back and cutting timber which has grown up in the interval, we were cutting trees which had been left in the first instance. We have gone back and cut smaller timber each time; we cut the pine and we cut the spruce, and a little balsam, and then all the spruce and balsam that was readily accessible. We cannot go on doing this.

When I first came into this country I was told we could go back every fifteen years and get a fresh cut. It cannot be done!

Now to touch upon one or two other points of the logging industry. Owing to conditions over which we have had very little control it has practically stood still. We have not advanced in the same proportion that different processes have advanced in the mills or other industries. We are still logging just about the way we logged when we first went in to this country around 1855 or 1860. Provisions are hauled into the woods in the same way. The camps are not built in the same way because instead of having a big fireplace and a hole in the roof they have stoves, but that is the only change which I have been able to see. The cullers do not live with the jobbers; they have little shacks of their own where they are more comfortable, but speaking generally, we have not changed a bit. We drive a river and build our dams in the same way. We build our tote roads and other roads in the same way, and we still operate

with the same equipment. I don't think there is a new tool in the woods. This is not a proper situation with the growing scarcity of labor. We have to use mechanical means for decreasing the cost of our logging.

Look at the fire protection to-day. When we started in to protect the forests from fire we had men and canoes. Now we have all sorts of equipment, and we are going in one bound to the most advanced mechanical equipment in the protection. You know the talk we have had about aeroplanes for use in fire protection. There is no question that a man with good common sense, as is the man who handles the woods will see the value of aeroplanes in this regard. We will probably be putting out fires with gas bombs before long. That is not foolish, it is something that is entirely possible now.

We can do that same thing now with the woods, but we will have to get some sort of gasoline equipment that will help us out with the heavy labor. We will not be able to get men at the wages we paid in the past. There is only one answer. We have to get out and get some kind of mechanical equipment to saw the trees down; some kind of mechanical transport to get out the timber and some way to drive the logs without such large crews.

Of course, feed has become so expansive that we will have to get away from horses. The motor truck has shown what a poor draft animal the horse is and he will gradually disappear. I am not prophesying, but I am telling you what will happen, and it will happen very rapidly, and we might just as well face the music. We have to turn from men who do things by rule of thumb, or in the our grandfathers did, to the men who are up to the times, and perhaps a little ahead of them.

One thing that has impressed me in the time I have spent in the woods has been the lack of observation on the part of men whose business takes them into the woods, or who have been practically brought up in the woods, and then have some student from a school come in and call our attention to conditions which we have known about all the time, but never took the trouble to observe. We pass by things over and over again, but do not observe them. We are too busy about something else. We don't observe how much timber there is per acre; how we are going to get it out; how we are going to drive this stream or that stream; conditions in the forest don't mean anything to us. If anybody should ask us how many trees in an acre in the woods on our limits there are very few of us who could give a definite answer.

You all know about the lack of information—definite information—in regard to timber limits. How many men can say how much timber is standing on the limits over which they have jurisdiction? How many men can tell you the proportion of spruce to balsam, or what happens after you cut out the trees in your logging operations excepting that a good many of them blow down amongst those which you leave?

We have got to depend on some people who are trying to observe, like Dr. Howe, in order to find out what the conditions are. Then we have to use our practical judgment and common sense to see how we can devise means to change the situation.

You all know of a case in point, where twelve or fourteen years ago we would not touch the balsam for our paper mills; would not hear of it. Then ten or twelve per cent. used to be allowed (of course a great deal more went in, but nobody knew anything about that) then we allowed twenty per cent., that is the millmen thought they were getting twenty per cent. Then we greatly increased it. The other day the president of a big paper company made the statement that they did not use a stick of balsam in their paper manufacture. He would not hear of it. That is all "tommyrot." He did not know that he was getting balsam. He was so ill-informed that he thought he was getting all spruce.

Time and time again the pulpwood shipments to the United States have been sold as all spruce when there must have been a very large percentage of balsam. The Laurentide is using up to 75 per cent. balsam, and I believe we make as good paper as anybody.

The Prop of Our Empire

British Government Stripping 5000 Acres of Timber Each Month for Emergency Uses

London, England, Oct. 15.—The humble bundle of firewood that in pre-war days used to cost one halfpenny has to-day more than doubled into price, for the present penny bundle of wood is little more than half the size of the old halfpenny bundle. Fine timber used in the making of furniture is now costing in some cases four or five times as much as in the early days of 1914. But although these big and sudden increases in price are due to the war, it should be borne in mind that for the past twenty years timber has been steadily rising in value, owing to the ever-increasing demand and the decreasing supplies. The world is cutting down its forests faster than the forests are growing, and unless something is done to counteract the destruction that is going on, there will, in the not far distant future, be a world-wide timber famine.

Nine-tenths of the timber hitherto used by us has been imported. Before the war we were annually importing on an average over 10,000,000 tons (or loads) of timber that cost us $27,500,000. In 1915 we imported just three-quarters of this quantity, but it cost us $32,700,000; and in 1916 the 6,319,000 loads we imported had gone up in price to $40,000,000, so in two years the load had more than doubled in value, having leapt from $3 to $7. Incidentally, wood pulp, from which is manufactured, went from, roughly, $5 to nearly $12 a ton, which is one reason this magazine is twice the pre-war price.

Russia supplied us with a little more than half our total wood imports, and Sweden was our second largest source of supply, with a total of 1,759,000 loads. France, Canada, the United States, Norway, Portugal, Germany, Spain, all, in the order named, contributed to our markets until the German submarine campaign compelled the British Goverment to forbid the importation of wood and concentrate ships upon bringing us food.

Consequently with the wood markets of the world closed to us, we were thrown back upon our own resources, which consisted of 3,000,000 acres of forests and woods. These figures will be better understood when it is known that no other country in Europe is so badly off for forests as is the United Kingdom, for whereas we have only four acres in a hundred under wood, Sweden has forty-seven, Russia has thirty-seven, and Germany twenty-five.

Still, we had to do the best we could with the woods at our disposal so to this end the Home-grown Timber Committee was formed to deal with the matter, and the way the members of that committee have surmounted the manifold difficulties that confronted them is little short of marvellous. When the committee first met, the whole business was in a terrible tangle. Their work was to supply out of British forests the wood necessary for the national needs. But there was no labour and no machinery, and the home markets were absolutely unorganized. Machinery was obtained after a great deal of trouble, and Belgian labourers were

used to reinforce the English labourers. The Belgians, however, did not prove very satisfactory, and they were supplanted after a time by Portugese, who certainly gave better results.

Then came the scheme for utilizing skilled Canadian lumbermen, who were enlisted as soldiers and brought over to grapple with our wood-supply problem. The men were formed into companies consisting of 175 men, and each company was perfectly equipped to tackle any work allotted to it, having its own railway and rolling stock, its steam-saw-mill, horses, and motor-lorries—in fact, everything for getting trees quickly from the forest to the consumer.

At the present moment the Canadian Forestry Corps musters 7,000 men, who are scattered up and down the country in forty picturesque lumber camps. These men are performing wonders; their general organization and their methods of handling trees are a delight to behold, and call for the highest commendation, and their camps have the true Canadian touch about them, the huts being built of split logs, just as they are in the backwoods.

You have only to journey over the countryside to see the inroads they are making on our woods. The famous pine-woods of Surrey are being wiped out of existence, and many of those beautiful spots so near and dear to Londoners may ultimately disappar owing to the urgent call for timber. Whole stretches of what were recently pine-clad slopes have been denuded, and by the end of the war it is doubtful if there will be a single pine of usable size standing in the United Kingdom. The ash too, is falling all over the country, for it is this tree that supplies most of the wood for our aeroplanes. It is reassuring to know we shall have enough ash to supply all our needs, but there will be little to spare and very few sizeable ash-trees unfelled by the time we have beaten the Germans.

As some indication of how our woods are being eaten up, it may surprise many to know that the New Forest and Windsor Forest alone have supplied three and a half million cubic feet of pine and a hundred thousand tons of pit-props. Very shortly the woods of the United Kingdom will be supplying us with timber at the rate of 500,000 tons a month, or 6,000,000 tons a year! Even then the demand will be greater than the supply; but thanks to our good luck in having been able to import timber for so long, we shall be able to pull through, whereas if we had been compelled to cut down our forests on the present extensive scale at the beginning of the war, they would have been exhausted long ago, and we should have been unable to carryon.

We are only just beginning to realise the vital importance of forests to our national existence and to the existence of the British Empire. We have been in the habit of thinking that our extensive coal-fields made us independent. Far from it, for we must have pit props in order to work our mines, and if pit timber gives out and we have to close our mines, then our whole industry crumbles. Our national existence depends upon coal, which in turn depends upon wood; so if wood fails everything fails, for we have no water-power to draw upon like the Scandinavian countries, no oil-power—no power but the heat which we get from the coal.

These are the unpleasant facts we have to face. The War Office is using 5,000 acres of timber a month, and very little is being done in the way of replanting these cut-down woods. If we were to let the matter rest as it is, our future national existence would be jeopardized. It is imperative that we start to create State forests, and that without delay. Municipal and private enterprise in afforestation must be encouraged. We must have extensive new woods, or else perish.

For thirty or forty years past the apathy shown by succeeding Governments to the question of forestry has been very reprehensible. Various

committees have given their reports, but practically nothing has been done.

The present members of the Forestry Committee have approached the problem in a very able and far-seeing manner, and their suggested scheme should have the active support of every man and woman who has the interests of the nation and the Empire at heart. It is proposed in the first ten years to afforest 200,000 acres of land at a cost of $3,425,000. Of this area, 150,000 acres will be planted by the State, and the remainder by public bodies. Planting is to continue steadily for forty years at a cost to the State of $15,000,000. By that time 1,180,000 acres will have been planted, and the State forests will be paying their own way. After that will come the planting of a further 590,000 acres, spread over another forty years.

The aim is to make the United Kingdom self-supporting in timber, so that it will not be necessary for us to buy a single stock from abroad for a period of three years, if the emergency arises.

We certainly canot do less, and there is no reason why, if the public only realize the important part forests play in the national life, we should not do very much more. We are spending on the war in two days as much as the whole scheme is going to cost us—and $15,000,000 seems a small sum when we recall that in 1915-1916 we had to pay $37,000,000 more for wood than we would have paid in normal times, simply because we were in a fix, and were not self-supporting in timber.

We have easily 5,000,000 acres we could afforest—some authorities put the figures much higher—and all would grow fine pine, which is the most important timber from a commercial point of view. It is true that much of this land is now used for rough grazing, but if we planted 2,000,000 acres of it with trees, it would have so little effect on our cattle-raising, that where we grow 1,000 beasts now, we should still be able to raise 995. In addition, we should have that glorious independence and strength that adequate State forests confer.

Germany, through her foresight, is producing from 50 to 90 cubic feet of timber per acre every year from her State forests, while our woodlands give us only 15 cubic feet per acre a year. It shows what State forests properly managed, can achieve. We can beat Germany in forestry if we set our minds on it.

From London Magazine.

NATURAL RESOURCES AFTER WAR.

At the annual meeting of the Molson's Bank, the president, Mr. William Molson Macpherson expressed the hope that as the end of the war approached the government would be as ready to remove restrictions in the way of the regulations of prices and other ways as the public would be to be free from them, and that "our statesmen in the reconstruction period will show sound judgment, tolerance and breadth of view."

Mr. Macpherson in expressing the opinion that the war would be over by the time of the next annual meeting declared that the period of readjustment would be awaited with some anxiety. "We have, however, every confidence that the exploitation of the natural resources of the country will enable us to return quickly to a normal condition."

"While the pulp and paper trade was expanding very rapidly and Canada was taking a leading position in these industries, largely because of her extensive natural advantages in water powers and forests, the wood was being used in such quantities that the replenishing of the forests by re-planting should engage the attention of the Provincial Governments" said Mr. Macpherson. In connection with the lumber industry he stated that as a result of a scarcity of labor in the woods this winter the output of lumber next year would show a considerable decline and would be largely increased in cost.

The Case for Nova Scotia's Forests

By Robson Black

Secretary Canadian Forestry Association

A Province With Rising Wood Costs and Declining Wood Supply---The Remedy!

NOTE:---This article has been issued as an attractive illustrated brochure for free distributi n throughout Nova Scotia.

Nova Scotia is essentially a forest province. By that, one does not underrate other lines of activity or suggest that the forests must flourish at the expense of other provincial interests. The facts are precisely to the contrary. A productive forest trespasses upon no soil desired by the farmer. It has no quarrel with the apple grower, the fisherman, the miner, the shipbuilder, manufacturer, or merchant. To each it supplies essential raw materials. To each its unfailing revenues give stability and confidence. When every citizen shares in the profits of maintenance, when every citizen pays dearly for neglect, the assertion is well justified that forest protection and the cause of Forestry are Community Business.

Facts That Cannot Be Glossed Over.

Apple barrels have increased in cost by 100 per cent. in the Annapolis Valley during the past four years. Wood materials for fishing boats, boxes, barrels, sheds and houses record a painful advance in price. Pit props for the coal mines are scarcer and much dearer. Western Nova Scotia lumber mills that were able to export 25 per cent. of a cargo in 12″ lumber, fifteen years ago, were forced to reduce the proportion of bigger lumber to 10 per cent. during the succeeding ten years and today are shipping out cargoes in which the larger timbers are inconspicuous. The significance of these facts to Nova Scotia's export trade is at once obvious. The scarcity of larger timber and its increasing inaccessibility in certain sections places a handicap upon the ability of provincial lumbermen to sell to the United States, West Indies, South America or the United Kingdom. The class of timber in greatest demand cannot now be delivered as formerly. This obviously ties the hands of the exporter. Industrial re-organization cannot remedy it, for the root of the trouble is in the Nova Scotia forest. The big timber simply is not there in quantities or locations to justify operating. The whirling saws of Western Nova Scotia mills do not in themselves create wealth. They give new utility and market value to the raw materials of the forest. Where the forest fails to support the mill, the mill is as useless as a disconnected turbine.

Nova Scotia's Future Depends On This

Export trade in forest, farm and sea products is the main hope of large provincial development. It is the magnet to new population, the trump card in the vastly keener competition of post-bellum days when Nova Scotia must either send superior goods, produced at low cost, to foreign shores or find foreign-made goods battling home products out of its home market.

Wood products in themselves form a chief item of present export, capable of vast development. Forest depletion not only negatives the growth of Nova Scotia lumber and pulp mills, but must pull down to mediocrity the wooden ship building industry and its expectation of home cargoes. It does more than that. The ability of the apple grower to sell abroad profitably depends upon his ability to produce cheaply. If he cannot obtain cooperage material or can obtain it only at high cost, his importance as an exporter is diminished to that degree. So with the fisherman.

The present condition of the Nova Scotia forests, taken as a whole, in-

ANOTHER EXPLANATION REGARDING SPRUCE

Portland, Ore., Oct. 19.—Selective logging costs four times as much as the ordinary commercial kind. That's why even a well-informed lumberman may be excused if he wonders at the high price of spruce used by the United States Government in the manufacture of the myriads of flying machines with which the allied armies are smothering the barbarians of Europe.

It is said that spruce cut and shaped into the wing beams and struts that go into the construction of an airplane represents an outlay of about $500 a thousand feet. To any one who has the time and the inclination to visit the spruce woods of Oregon and follow the trail of the airplane stock from its native tree thru the various stages of its evolution until it finally is built into the winged death to Germans at the big eastern factories the only astonishing thing is that the ultimate cost is not greater.

Take the logging operations for example. Down in the heart of the greatest spruce belt in the world near the shores of a little Oregon bay is the headquarters of one of the big logging projects of the spruce production division of the United States Army Signal Corps. Under the supervision of the Government the Warren Spruce Co. operates this project which has since February furnished Uncle Sam with more than 7,000,000 feet of the highest grade airplane stock that grows. Preliminary to the actual logging out process the company had to spend an immense sum in buying locomotives, flat cars, donkey engines, steel rails, tools and equipment. A main line railroad seven miles long had to be graded over a rough piece of country and before a rail could be laid more than 8,000 feet of expensive piling had to be driven, the timber for this being cut and hauled out of the woods along the right of way.

A PAPER RACE TRACK.

New York. Oct. 31.—This year's international six-day bicycle race at Madison Square Garden, the week of December 1-7, may be held over a paper track. A well-known manufacturer has made a proposition to lay a track such as has been in use in Paris for several years. It is said a paper track has more durability than a wooden course, and insures better speed. The cost, too, is much less. Indeed, a papier mache track would revolutionize six-day racing. The inventors promise a demonstration before November 10. Right now it is only a question of procuring the material. A ten-lap track will require about 40,000 square feet of material. It can be built in sections, and can be put together in about five hours. It takes about forty-eight hours to lay a board track, which becomes worthless after a race.

A TYPICAL B. C. LETTER.

Jessica, B.C., Sept. 21, 1918.
Canadian Forestry Assoc:

It is with the greatest pleasure that we accept membership with you and assure you of our hearty support and co-operation in any movement you make to protect our timber from the ravages of forest fires. We, too, believe it to be the duty of every lumberman in Canada to identify himself with your association.

Wishing it all the success it deserves

Yours faithfully,
Fir Tree Lumber Co.

COL. DENNIS TO SIBERIA.

Colonel John S. Dennis, C.M.G., President of the Canadian Forestry Association, has been appointed Canadian Red Cross Commander for Siberia. Col. Dennis, is familiar with conditions in Siberia, from residence both in Northwest Canada and Russia, where he is a member of the Russian Investment Company. For the past fourteen months he has been second in command of the British-Canadian Recruiting Mission in the United States.

dicates a progressive decline. Fires have taken a monstrous toll of what originally was an endowment of incalculable worth. To be sure, the *cutting* of timber was not managed on a principle of continuous reproduction, but fires undoubtedly have been the chief degenerative factor. Had fires been debarred by modern protective means and by cultivation of a conservation sentiment amongst persons who cause the fires, there is no doubt whatever that lumber mills instead of reducing activities would have added to plant and to number of employees, developing their towns, providing new demand for farm and fisheries products and taking more vigorous hold of export trade opportunities. There is, of course, small satisfaction in basing a forecast upon impossible premises. The original forest wealth of Nova Scotia has largely been forfeited. Today not more than 100,000 acres of virgin forest remain. Two-thirds of the forest area has changed from the precious pine spruce and hackmatack, on which the modern mill exists, to the secondary hardwoods which form a minor item of commerce. This is the unfortunate situation of the permanent timber crop covering about *eighty per cent.* of the entire provincial area. As that eighty per cent. is non-agricultural, the greatest problem now facing the people of Nova Scotia is to block the forces that are leading the main portion of the provincial estate to the edge of ruin and then to institute such measures as will hasten its restoration. No question that can possibly confront Nova Scotians has more than a fraction of the urgency associated with this enterprise of repairing the forest foundations that uphold the walls of prosperity.

An Opportunity To Double The Timber Yield.

"Here is a natural resource," states Dr. B. E. Fernow, director of the Nova Scotia Forest Survey, "capable, under proper management, of forever producing by annual increment, as interest, at least twice as much as is now being cut from capital stock."

The Forests of Nova Scotia, in Dr. Fernow's estimate, represent a potential capital of at least $300,000,000. And yes, "it is now largely in poor condition and is being annually further deteriorated by abuse and injudicious use."

This is Public Business!

It is to the State we are compelled to look for initiative and continuity of policy in the care of forest lands. The long time-element involved in the maturing of timber crops is constantly at war with the natural human desire for "present profits." The latter consideration, however, is properly divorced from the function of governments. In nearly all well-organized lands, the public administrator is regarded as the natural custodian of the forest properties—most easily destroyed of all the material resources. The Nova Scotia of 1979 is to a considerable extent in the hands of the Government of 1918. If the forest possessions are not husbanded today, there will be no tomorrow in which to husband them.

What Other Governments Are Doing.

What are other Governments doing to maintain their forests?

New Brunswick last year created a new Forest Service, at the head of which is a Provincial Forester and a staff of technically-trained Foresters and fire rangers. The service will cost New Brunswick about $100,000 a year but will repay the cost many times over.

Quebec has a Forest Service, with a Provincial Forester and more than forty technically-trained assistants, besides a splendidly-organized set of "forest protective associations" which are rapidly subduing the plague of forest fires.

Ontario has a Provincial Forester, with more than a thousand fire rangers and inspectors, costing $500,000 a year. And it pays!

The three prairie provinces are under the Dominion Director of Forestry, with a large staff of subordinates, engaged in fire prevention.

British Columbia has a strongly-organized Forest Service with a Provincial Forester and a group of District Foresters and rangers.

Nova Scotia Legislature Endorsed Provincial Forester.

What of Nova Scotia?

Nova Scotia has no Provincial Forester, although the need of such an organizer and authority is quite as acute as in British Columbia or New Brunswick. That such an officer is essential to the province was recognized by legislation passed in May 1913, providing for his appointment.

What would be the duties of a Provincial Forester in Nova Scotia?

1. To properly organize and develop the present fire ranging, Nova Scotia has excellent legislation already in plan, an existance for prevention of forest fires and the forested areas are so located as to make fire pretection relatively easy. What is required, therefore is that the existing legislation should have thorough and expert application. Only a technically-trained Forester can accomplish this.

The natural rate of forest growth in Nova Scotia is so favorable that, with fires excluded, restoration of the timber values must take place over very large areas.

2. The day of haphazard lumbering is over in all parts of America. While the virgin forest remained, the incentive to conservative lumbering was anything but imperative. Now the virgin forests of Eastern Canada are mostly cut out. The pulp and lumber companies are reaching out for technical guidance in the management of their forests so as to perpetuate the supply and save their huge investments. To assist with expert counsel the Provincial Government in the management of the remaining Crown lands and to co-operate constantly with the private woodland owners, whether mill operators or farmers, would be another important part of the Provincial Forester's duties.

The Power of Education in Forest Guarding.

3. To this officer would naturally fall a third highly important function which is surely a government's function—to campaign against carelessness with fire. The 'average man' who leaves his camp fire burning or throws away lighted matches and cigarettes is not malevolent by intention. He merely does not "think" because amongst all the impressions he gathers in a day's journey he may never encounter a suggestion that camp fires cause great forest conflagrations. The act is not mentally associated with the idea of vandalism. Educational propaganda against forest fires, tackles this 'average man' by skillful appeals to common sense and selfish interest. It is to forest protection as hygiene in disease prevention. It modifies the careless attitude, puts out the *match* before a hundred rangers are asked to put out the *holocaust*.

A Provincial Forester in Nova Scotia, by public meetings, lectures, work in the schools, newspaper publicity, distribution of literature, etc., can do a remarkable service in the provincial interests.

Cut Down Railway Fires By Co-operation.

4. Yet another most valuable consequence of the appointment of a Provincial Forester for Nova Scotia would be the lessening of timber waste from forest fires caused by the railways. As has been true in all forested provinces of Canada, the task of guarding against fires set from railways requires special organization and unremitting vigilance.

Since the Dominion Board of Railway Commissioners undertook the direction and supervision of railway fire protection in 1912, the destruction of timber areas contiguous to the private-owned railway lines has materially lessened. In the case of the public-owned railways, (not under the Board's jurisdiction), co-operative arrangements have in some cases been worked out, usually through the provincial governments, by which patrol work and right-

of-way clearing and inspection of smoke stacks and ashpans on locomotives have been developed with excellent results.

The Dominion Board of Railway Commissioners, however, has worked largely through existing forestry organizations, as in Ontario, Quebec, New Brunswick, British Columbia, and on Dominion lands in the West, conferring upon certain of the forestry officials a special authority, as inspectors for the Board, to check up the fire protection work of the railway companies.

In Nova Scotia, however, there is no special provincial forestry organization, and no Provincial Forester. The Railway Board, therefore, has been unable to extend the benefits of its railway fire inspection to the railways of the province to the fullest extent because its own immediate staff is inadequat to provide the necessary degree of close and continuous inspection required for the best results.

Should Nova Scotia follow up the legislation it has already adopted and appoint a Provincial Forester, that officer would immediately be constituted a representative of the Dominion Board of Railway Commissioners for purposes of railway fire Protection, with all the authority that goes with such designation.

The Board of Railway Commissioners, however, is handicapped to a certain extent in securing improved results in railway fire protection by the lack of a local inspector. This lack could be most readily and logically supplied as an incident to the appointment of a Provincial Forester, with resulting benefit to the business interests of the province in general.

Benefits Suspended Until Province Appoints a Forester.

It is but just to recognize that the railways in Nova Scotia have shown an interest in forest protective work and have issued excellent instructions to their employees dealing with fire prevention. No doubt the latter have had effect, but experience has shown that railway employees closely engaged on duties directly connected with their positions cannot be expected to give fire protection as much attention as if they were in personal touch with a special inspector.

CLASSIFICATION OF NATURAL RESOURCES WITH REFERENCE TO THEIR POSITION AS REGARDS STATE CONTROL

By A. C. Thrupp

Forest School, Univ. of Toronto

The Resources of a country may be put under four headings. The first is:

1. Resources inexhaustible.

Under this heading there are not many. *Air*, salt from the sea, stone, sand, gravel, clay, limestone and water in a certain sense.

Sand, gravel and clay may be considered as being deposited or manufactured by nature much faster the man could use them. The state need have no concern about them for the future as likewise with stone as man can but nibble at the supplies of the latter in the world. Water is a resource which man can only alter in its seasonal distribution so it can be taken as a perenially permanent resource.

2. Resources exhaustible and non-restorable.

Coal is the most important resource under this heading. All that the State can do to prolong the supplies, is to prevent waste in mining and use; and to encourage the use of restorable substitutes as wood and water power. Of *Oil* and *natural gas* the same may be said. Other resources under this heading are the mines of gold, silver, copper, iron and many other minerals. They are exhaustible in the fullest sense and forever gone when once used up.

3. Resources restorable but liable to deterioration under uncontrolled private activity.

Resources under this heading may be put into two divisions.

(1) Resources which *can* deteriorate so far as to be totally impractical or absolutely impossible to restore. These resources are game,

Useful Forestry Books

FERGUSON—FARM FORESTRY

By John Arden Ferguson, A.M., M.F., Professor of Forestry at the Pennsylvania State College. VIIIx241 pages. 5¼ by 8. Many full-page half tones. Cloth, $1.25 net.

Covers especially the subject of forestry as applied to the farm and woodlot. The subject is treated from the broad standpoint of the woodlots in the great plains and prairie regions, as well as in the more eastern regions.

KINNEY—THE DEVELOPMENT OF FOREST LAW IN AMERICA

By Jay P. Kinney, A.B., LL.B., M.F., Chief Supervisor of Forests, United States Indian Service. XVIIIx275 pages. 6 by 9. Cloth, $2.50 net.

This book discusses the chronological development of legislation directed to the preservation of existing forest resources, reforestation of cut-over, burned-over areas, the extension of forest areas, and the systematic management of forests for productive purposes.

KINNEY—THE ESSENTIALS OF AMERICAN TIMBER LAW

By Jay P. Kinney, A.B., LL.B., M.F. XXIXx279 pages. 6 by 9. Cloth, $3.00 net.

This book contains information that will prove of inestimable value to anyone who desires to ascertain easily and quickly the fundamentals of American timber law, or who needs reference to court decisions to support a well-founded view as to the law upon any particular point.

WOOLSEY—FRENCH FORESTS AND FORESTRY. Tunisia, Algeria and Corsica. With a Translation of the Algerian Code of 1903.

By Theodore S. Woolsey, Jr., M.F., Assistant District Forester, United States Forest Service, 1908-1915. XVx238 pages. 6 by 9. Illustrated. Cloth, $2.50 net.

Embodies the result of a study of the more important phases of forest practice in Corsica, Algeria and Tunisia. The author's experience abroad includes not only continental Europe and the French Dependencies (which latter are described in this book;, but also forest management in British India as well.

BRYANT—LOGGING. The Principal and General Methods of Operation in the United States.

By Ralph Clement Bryant, F.E., M.A., Manufacturers' Association. Professor of Lumbering, Yale University. XVIIIx590 pages. 6 by 9. 133 figures. Cloth, $3.50 net.

Discusses at length the movement of the timber from the stump to the manufacturing plant, and the chief facilities and methods for doing this; with especial reference to logging railroads.

TAYLOR—HANDBOOK FOR RANGERS AND WOODSMEN

By Jay L. B. Taylor, Forest Ranger, United States Forest Service. IXx420 pages. 4¼ by 6¾. 236 figures. Flexible Binding, $2.50 net.

Prepared as a result of the author's experience in field work of the United States Forest Service. Solves problems which confront a forest ranger in government, state and private employ. The suggestions offered will also be found of use to others whose work or recreation takes them into rough or unsettled regions.

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fish and the various animal products that man uses. The species that provides the resource can be made extinct or so rare that it ceases to be of any use and couldn't be restored in hundreds of years. The passenger pigeon and buffalo of N. America are two of these; they were resources but are not now, and cannot be restored. The whaling industry is going the same way, and ivory trade may follow. Many other instances can be found.

(2) Resources which are usually restorable, i. e., the *forests* and the waterpowers which are dependent upon them. The forests are in most cases restorable though frequently not to their former value for instance, a white pine forest cannot be practically restored again over large areas in Eastern North America, owing to the complete burning of all the vegetable matter which made the soil on the rock. Some species may be able to grow here but not the valuable white pine; in those cases the resource of the white pine forest is gone. On the other hand in deep

mineral soils the forest is always restorable. Therefore the State's duty is to see that the forests are not *destroyed* forever, but *used* forever, and this is best done under *State ownership*.The Water powers of the streams need not be entirely under state ownership but it would be best for the most economical use of them, that the state store and regulate the flow on rivers and streams on which power is developed by public utilities or private use.

4. Resources restorable, yielding increased returns under increased activity.

Under the head come all the products of the labour and brains of man as wealth, knowledge and other fields of progress due to either private or state activity.

The soil is certainly a valuable resource, and under *intelligently* increased activity it most certainly yields greater returns. As it is a short time investment it thrives under private activity and the State's relation to it need only be one of an educational adviser and a leader in experiment and progress. On the other hand it can deteriorate under mismanagement but very rarely so far that it cannot be restored.

REFORESTING FRANCE.

In a note from France to his father, Mr. D. B. Detweiler, of Kitchener, Ont., Lieut. Detweiler refers to the recent interesting transfer of the Snider woodlands in Waterloo County to the care of the Ontario Forestry Branch.

"Mr. Snider of Conestogo has the proper view of things. If some of our wealthy farmers followed his lead it would be a wonderful thing for the future of our Province. Reforestation is the one big idea in France, and even at the present time the Government is preparing and planting vast forests. Only yesterday I attended a banquet given in honor of the visit of the Civil and Military Chiefs of Forestry in France.

The Canadain Forestry Association's Exhibition Car was badly smashed in a head-on collision at Springhill, Nova Scotia. In the car were a large unmber of exhibits demonstrating methods of forest protection, such as model aeroplane, model lookout towers, a Marconi wireless set in operation, forest telephones and many other interesting objects. These were badly thrown about but serious breakage was relatively small.

At Moncton through the courtesy of the Canadian Government Railways Management, the contents of the car were transferreed to a new coach which was taken to Quebec City for a run through the Lake St. John country and central Quebec. About that time the influenza epidemic arrived and closed down all public meetings. The Exhibition Car, however, will continue on its way until the winter season sets in in earnest.

The Association hopes to send out a Car early next Spring with a much more elaborate equipment than was possible in this year's experimental stage.

Col. J. S. Dennis, President of the Canadian Forestry Association has been chosen by the Canadian Government as a member of the Commission which will have charge of the Dominion's Commercial interests in Russia.

An Open Letter to Members!

To take up a gun—
—and get into step—
—and drill and march—

is one way, and a great way, of doing Canada a service.

But when a busy man—
—quietly turns to his neighbor—
—and says: "Join the Forestry Association"

He is doing a patriot's work in direct support of the man with the gun.

Hundreds of our members the last month or so, have gone to a little trouble to recruit a new supporter of the Forest Conservation Movement.

And hundreds haven't.

They have said, "I haven't time," little knowing that the Canadian Forestry Association gets most members from the rushed-to-death executive, the business man whose minutes are worth dollars.

We ask you to score a New Member to your credit today. As a special inducement we will mark his membership and subscription paid up until December 31st, 1919.

BUT, to be a member of the Association means far more than subscription to the Forestry Journal. The latter is an incidental to membership, but we intend to make it a more attractive incidental during the remainder of the year.

Canadian Forestry Association

Booth Building, Ottawa.

Not affiliated with any government or commercial interest.

How About Operators?

Prospective users of wireless usually ask us: "But what about operators? Aren't they hard to get?"

The answer is: "Not if you use C & W apparatus."

The old style sets, with their high voltage, low factor of safety and numerous critical adjustments, could be operated only by an expert, with a specialized training,—and such men are hard to get.

But C & W sets have a voltage of only 200 volts as against from 8,000 to 20,000 volts in the old style sets, a factor of safety of ten as against one and a half, and no critical adjustments. These factors make a set so simple, rugged, reliable and easy to operate that anyone who knows the code can operate C & W sets and keep them in operation—and learning the code is a simple matter taking from four to six weeks. If C & W sets are installed in your forests, your wardens can operate them after a short training.

No C & W set has ever broken down in service; the initial cost of a C & W set is about one quarter that of other sets on the market; the upkeep costs are almost negligible; and you can always get operators for C & W sets among your own men.

May we help you solve your problem? Details and expert advice from our engineers upon request.

Cutting & Washington, Inc.

1083 Little Building - BOSTON, Mass.