

Canadian Forestry Journal

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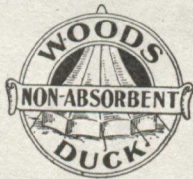
No. 9



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Canadian Forestry Journal

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ROBSON BLACK, Editor.

Vol. XIV.

WOODSTOCK ONT., SEPTEMBER, 1918

No. 9

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Growing a New Forest Family at St. Jovite

By A. C. Volkmar, Forester, The Riordon Pulp and Paper Co.

Over Three Million Little Trees Being Prepared for Reforestation in Canada's Newest Nursery.

The reforestation policy of The Riordon Pulp & Paper Co., Ltd., was first started in 1916, when an experiment was made with Norway spruce seed, in a small quantity. The results were encouraging, and in 1917, it was decided to develop a nursery with an annual production of 1,000,000 select three-year-old transplants of spruce and about 100,000 select three-year-old transplants of white and red pine.

With this object in view a farm near St. Jovite was purchased and the part best suited reserved as a nursery. The soil is light and sandy, with a clay subsoil, about three feet from the surface. The site is a slightly rolling area, with a western aspect. To insure proper drainage in spring, a system of blind drains, or trenches filled with stone covered with earth, has been installed, which successfully carries off the surplus water.

The seed beds have been arranged to allow for three sets with an annual production of about three million seedlings each year. In this manner one set will lie fallow each year, following the removal of two year seedlings to transplant beds. The fallow beds will be sown to cow peas and clover, same being plowed in, as fertilizer, in addition to such quantity of other fertilizer as proves necessary to maintain the soil in fertile condition. The beds have been arranged to run with the contours, and where erosion is likely to occur, beds have been elevated on the lower side, so that the path-ways will check the flow of surface water and allow it to seep in more gradually.

In cases of heavy slopes, the lower sides of the beds have been re-inforced with boards.

Watering System.

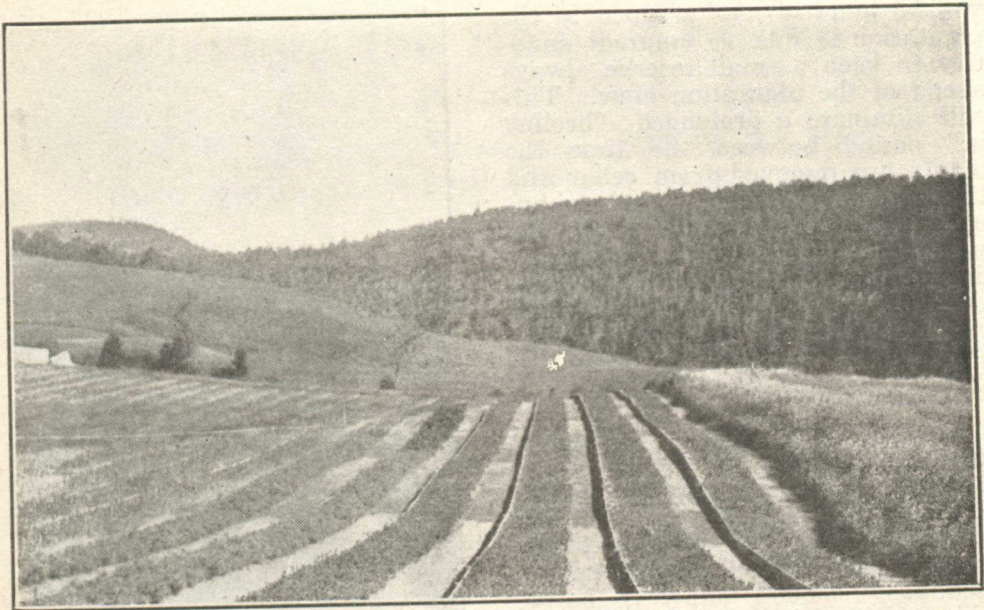
As no natural water supply was at hand, a tap line 2,500 feet long was run down to the village main and the water brought to the nursery by gravity pressure. This pressure was not sufficient for spraying purposes, so an open cement tank 10x10x10 ft. was built and the pressure for spraying supplied by a gasoline engine and pump.

Shade Frames

The shade frames now in use are 12x4 ft. covered by a coarse mesh burlap, on a roller, so that the frame body remains on bed all season and only the burlap is rolled up, or unrolled, as the occasion requires. The nursery is so located that no natural shade is at hand, and consequently the seedbeds are kept under this diffused light during sunny days, and as the soil is light, and the heat and light strong, two year old seedlings will be kept shaded during extremes of heat, at least. The life of the burlap is about 2½ seasons, but when the saving in labour is considered, in covering and uncovering the beds, the expense is practically no more than with lath frames.

Winter Protection.

Winter protection demands considerable attention, and is very necessary, as proven by experiment. The ground usually freezes to a considerable depth before the snow comes, which results in "heaving" to a great extent in the spring. To obviate this, the beds are covered with



Showing Spruce and Pine Transplant Beds on Heaviest Slope.
Displaying Method of Erosion Prevention.

straw, little by little, while the ground freezes, and then covered to a thickness of one foot, with straw—or about six inches when old burlap is laid over them. By gradually removing this cover in the spring, "heaving" is practically eliminated as well as sun scorching. The worn out shade frame burlaps will be used for winter covering until completely useless, and the old straw piled and allowed to produce what fertilizer it will.

The Seeding Process.

Both broadcast and drill seeding have been used each offering certain advantages, but in view of the heavy winter covering required and the necessity of cultivation and keeping the soil sweet and fresh, the drill system will be used. This requires more space and is more expensive than broadcasting, but the final results will offset the extra cost.

Care of Seed beds

The seed beds are given every possible care, including weeding and cultivation; spraying to supplement rainfall when necessary, so that the soil does not become thoroughly dried out; and covering with shade frames

during sunny days, or heavy down-pours of rain, and uncovered on dull days or during ordinary rains.

Transplanting

The two year seedlings will be dug out in late fall of the second year, and carried over the winter in a sand cellar, to be built for that purpose. In the following spring, as soon as the ground is ready these will be transplanted in nursery rows, about 12 inches apart, and spaced about 6 inches apart in the rows. No attempt to transplant in beds will be made as this requires too much labour and expense. The actual transplanting will be done with the aid of the Yale transplanting board.

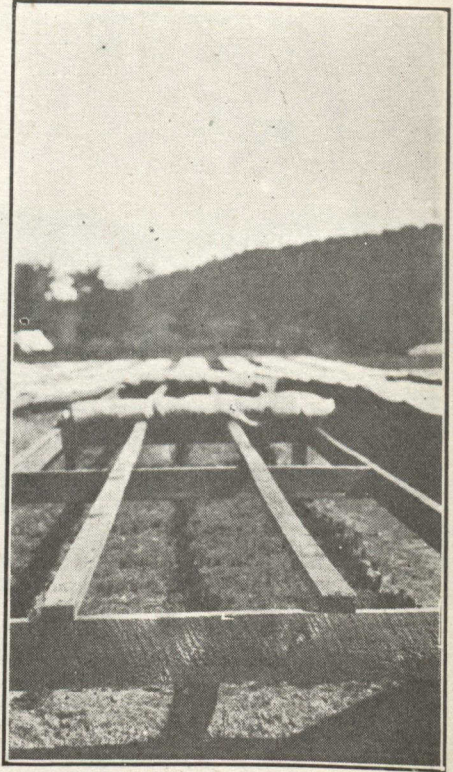
The care the transplants will receive will be confined to cultivation and watering in case of severe drought only. Two complete sets of transplant areas will be used, allowing one to lie fallow each year, in order to build up the soil value.

Digging out and Shipping

In the late fall of the third year the transplants will be dug out and carried over the winter in the storage cellar. In the following spring these

will be bundled and shipped to the plantation in lots of required quantity to keep a small reserve always ahead of the plantation crew. This will eliminate a prolonged "heeling in" period between the time the plants are removed from cellar and the time at which they are permanently planted. By means of the system of digging out two year seedlings and three year transplants in the Fall, the work will be distributed over the season, rather than being crowded into a short period in the spring.

The foregoing outlines the policy upon which the nursery is being developed. The result so far obtained includes a stock of about 2,000,000 one-year-old Norway spruce seedlings 800,000 one-year native white spruce seedlings, 200,000 one-year native white pine seedlings, 75,000 three-year Norway spruce transplants, 100,000 four-year Norway spruce transplants, 5,000 five-year twice transplanted white spruce and white pine, and about 5,000 two-year seedlings of bull pine, or a total of about 3,185,000 plants of all classes.



Showing Manner in Which the Shade Frames are Constructed and Used.

Exaggeration of Canada's Wood Supply

Mr. Phillip T. Dodge of the International Paper Company, is reported in the New York Times as saying: "Most serious is the matter of pulp wood, from which paper is made. The forests of the United States are in great measure exhausted but in Canada there is a vast supply, largely on Crown Lands. For years this came freely to the United States, being cut under extensive leases, but exportation from the important sections is now prohibited and the mills of this country are placed at a great disadvantage. If the wood supply for the making of paper is practically exhausted in the United States, how long does anyone think it will take to place Canada in the

same position if all the American mills are allowed free access to her supplies? The uses of wood pulp are rapidly increasing, the consumption of paper is not likely to diminish and while Canada has a large supply it is by no means 'vast'."

PLANTING ON THE PRAIRIES

Last year on the 160 acre forest tree nursery of the Dominion Forestry Branch at Sutherland, near Saskatoon, one half million trees were shipped to farmers in the province. Two years ago three million were shipped out. The trees are taken up in the fall and set out in the spring.

Planting the Home Grounds

By E. B. Luke, Montreal.

How to Organize Trees and Shrubs to Produce Maximum Beauty Without Large Outlay.

The art of ornamenting the home grounds, known as Ornamental Gardening, Landscape Gardening, etc., while undoubtedly one of the most important of the Arts, is nevertheless, in Canada, very far behind such of its brother Arts, as for instance, Architecture or Inside Decoration. Nor is this to be wondered at, for our efforts have been expended more along the lines of necessity and utility than adornment. As a consequence, we compare very unfavorably with the older European countries and it has apparently become a settled fact in the minds of many that we may never hope to attain the place they hold to-day in the world beautiful. On the other hand, if the matter be thought over carefully, not one of us will be willing to dispute the fact that there is not a single reason why Canada, if she receives that full development which it is our duty to see that she gets, should not, in years to come, be as beautiful a spot as there is on this earth and become in reality, as one of our leaders put it, "the brightest star in the British constellation."

Feared as a "Luxury"

It has been perhaps only during the past quarter of a century that any real advancement has been made in Ornamental Gardening and during that time and even now, the work has largely been done by professionals for either municipalities, corporations, or wealthy individuals. We should, I think, first disabuse our minds of the impression that the luxury of landscape gardening can only be indulged in by the rich or by those owning large estates, for there is no lot or plot of ground, no matter how small, that is not susceptible to vast improvement by proper and

intelligent planting, and there is no intelligent person who loves and knows flowers, has some artistic taste and will study the fundamental principles of Ornamental Gardening, who cannot, at least, tastefully landscape his own home grounds.

It would seem, moreover, that this is a particularly opportune time for a wider educative propaganda on this subject, so that the many thousands of Canadians who are now gardening of necessity, many of whom will hereafter garden for the pure love of growing things, to say nothing of the satisfaction and saving in doing so, and who will be contented with nothing short of a home garden of their own, should be assisted along the right lines to the end that their home grounds may be a credit to themselves, a credit to their town or city, and an added asset to our country.

The study of Art and Nature has a most refining, elevating and recreating effect upon those who pursue it. Worries that cannot be forgotten in other pursuits for happiness, even in sleep, completely disappear in this intensely absorbing, and wholesomely delightful occupation.

Organized Beauty

Landscape Gardening is the art of creating organized beauty; of making one harmonious whole of many dissimilar parts. There are two styles most commonly in vogue, the Natural and the Formal or Architectural. The former is sometimes called the English style, and the latter the Italian. The natural style is undoubtedly the favorite in England, Canada and the United States.

In Canada I would like to see a distinct Canadian style of natural landscape gardening, and one which

would use the species and varieties of our own country, rather than the exotic or foreign varieties, harmonizing this material in its arrangement with our own style of architecture as applied to our houses or buildings as well as with our own natural landscapes.

In the laying out of grounds, however, whether in formal or informal style, in order to get a clear and definite conception of the results in a finished state, a plan should be made, and after being decided upon should be strictly adhered to. The foundation of the Natural style of Ornamental Gardening is the open lawn. The plantings should, generally speaking, be confined to the boundaries; buildings where possible, ought to be located at one side; drives and walks should never be cut straight through the grounds, but of graceful curves, unless there is the best of good reasons for having them otherwise, for you will seldom find a straight line in Nature. Trees should be planted in groups—never in straight lines—for that is the way they are found in Nature.

A liberal planting of shrubs and flowering plants is fully in accord with the Natural style of gardening and these should be planted in clumps and masses, for nature rarely scatters her plants. Tall trees should be planted to screen out objectionable features in the near landscape and low shrubs and plants to keep before you some desirable features of the surroundings.

The use of Shrubs.

In order to obliterate the lines of demarcation of a building, shrubs should be grouped irregularly around its walls and massed in the nooks and corners. Climbers should also be planted to cover certain portions of the walls and porches. Avoid the conventional rockery unless naturally placed. Don't place a trellis on a lawn for climbing plants. Let them climb naturally on the porches, walls, trunks of old trees, or over the tops of shrubs. Be careful in placing the summer-house, for if placed naturally and artistically, it is a feature of

harmonious beauty. If not, it can easily be made a monstrosity of ugliness. Wherever possible, avoid a fence, for there is no beauty in the fanciest fence made; in fact, the fancier the fence, the uglier it is. A hedge, while planted in a straight line, may be broadened out at one point, drawn in at another, and finally merged into a clump of trees or shrubs, and thus serves the purpose of a fence and at the same time adds to, instead of detracts from, the naturalness and beauty desired.

I dislike "weeping trees" of the top grafted, umbrella-shaped species, and shrubs or evergreens sheared into unnatural or grotesque forms, not only because of their ugliness, but also because of their lack of harmony in otherwise natural surroundings. Yet it is strange the fascination these have and the prominence given them on so many of our Canadian lawns.

Plan the Grounds.

A plan of one's grounds should express an idea as well as perform a service. It should be in harmony with the architectural design of the dwelling and its proper design is just as important, for one dollar expended on the grounds will produce more beauty than twenty spent on the house. It is, therefore, surprising, that of the vast amounts of money expended on the Architecture of the dwellings in our land, more thought and money is not devoted to the proper treatment of the grounds, for good grounds, like good houses, result only from intelligent study and design. Especially is it surprising, as there are so many good books on the subject of Ornamental Gardening, any one of which will give an intelligent person a working knowledge of the subject. —E. B. Luke.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year.

The Race for Aeroplane Spruce

By J. H. Hamilton,
Editor "Industrial Progress," Vancouver.

Three to Four Thousand Men Engaged in Speeding Up the Wood Supply in British Columbia.

A few months ago the amount of aeroplane spruce being produced in B. C. was practically a negligible quantity. The campaign of production inaugurated by the Aeronautical Branch of the Imperial Munitions Board, with the hearty co-operation of the Forest Department of the British Columbia Government and of the lumber trade in the province, has produced results far beyond the expectation of the most ardent optimist. When the whole tale can be told, the result attained will be a source of pride to the organizing ability of the province.

The Commission of Conservation, in a recent report of their investigation, estimated that approximately fourteen billion feet of Sitka Spruce is available on the coast of B.C. Only a very small proportion of this, of course, is available for aeroplane stock, but it represents practically an illimitable supply nevertheless. The spruce on the Coast is the Sitka Spruce (*Picea Sitchensis*) also known as Giant Spruce, Silver Spruce, Tideland Spruce or Alaska Spruce. The spruces are very valuable forest trees found in every country in the Northern Hemisphere. They yield excellent lumber, and are unsurpassed for pulp manufacture. Seven of the eighteen species grow in North America. Sitka Spruce, the giant of the genus, both in size and quality, grows only on the Pacific Coast. Mature trees average 150 feet in height and 4 feet in diameter, while some trees grow to over 200 feet in height and 10 to 15 feet in diameter. The tall, straight poles with their moderate taper, furnish saw timber of the best quality and in largest dimensions, unusually clear and free from defects.

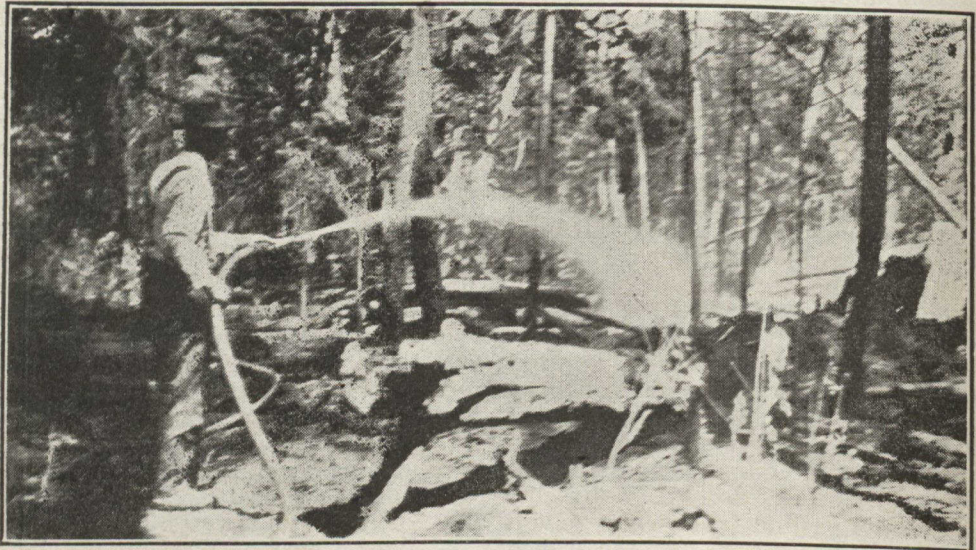
It has been stated by the Imperial authorities that after a world-wide search and the most stringent tests the Sitka Spruce of the Northern Pacific Coast is by far the most suitable wood for the construction of aeroplanes. Its value for this purpose depends more upon its elasticity and toughness of fibre than upon its actual strength. Douglas Fir, for instance, is stronger wood than Sitka Spruce, but far more brittle. The length of fibre of spruce enables it to take a lateral strain without breaking better than almost any other wood. The distribution of spruce on the coast of B. C. is very wide, practically the whole of the coastline for a distance of several miles inland being heavily timbered with this tree, some parts, of course, far more densely than others.

Speaking generally, the largest trees grow on the Queen Charlotte Islands and there are some very fine stands on the West Coast of Vancouver Island and the northern section of the Mainland Coast. The forests of the Queen Charlotte Islands were practically virgin until the aeroplane spruce loggers went in early this spring. It is hard to say just where the finest timber is, for the stand is so large that the production so far has practically only touched the fringe of the available supply. It is stated by the authorities that the production of cut aeroplane stock has been trebled during the past three months and that the speeding-up process is continuing in the same ratio. Figures regarding the actual output cannot be published for obvious reasons, but it may be stated that from three to four thousand men are employed directly in the industry in the logging camps and mills.

The establishment in Vancouver of a Forest Products Laboratory by the Department of Forestry of the Dominion Government, under the direction of Lieut. L. L. Brown, will be of immediate value to the development of the spruce industry. One of the first tasks to be undertaken by the new laboratory will be an exhaustive examination of the Engel-

mann spruce, also known as the White Spruce, which grows very freely in the interior of B.C. It is estimated that the stand of Engelmann Spruce is approximately fifty-eight billion feet, and if found to be practicable to bring this material into line with the rigid requirements of the Aeronautical Department it will provide a further huge supply of material for the use of the Allies.

Fire Pump Withstands Severe Test



600 ft. Hose used Here. This Bush is all Burning—the Picture Hardly Shows It.

On several occasions it has been estimated by practical men in forest protection work that two hundred men with water buckets cannot equal in fire extinguishing efficiency the services of one modern gasoline fire pump. Proof of this contention was recently encountered in the Cochrane Division of the Ontario Forest Protection Service. Mr. E. G. Poole, the Fire Superintendent, despatched one of the Johnston pumps (F.M. make) to a threatening forest fire in the Kapuskasing district. A saw-mill and other buildings were in the gravest danger of destruction. The efforts of scores of men had proved of little use. The pump was set to work with several feet of hose stretch-

ed across tree trunks to hold it above the blazing ground. Much trouble was encountered in preventing the burning of the hose. A fifty-foot stream was soon working on the buildings and the surrounding ground delivering a bulk of water that no quantity of fire pails could have equalled. For eighteen hours, practically without a stop, the portable pump stuck to its job and saved the properties. At one time, the gasoline tank caught fire from a leak and the engine was thrown bodily down the bank and into the Kapuskasing River. In a few minutes it was retrieved, some of the mud rubbed off and again starter pumping with no loss of power.

A Small Town in the Wood Business

Perth, Ontario, Sells Hardwood, Delivered,
at Eight Dollars a Cord and Makes a Profit.

How an Ontario municipality, not afraid to tackle fuel difficulties along new lines, has brought to the doors of its citizens 1900 cords of wood this year, at a cost of \$8 per cord for hardwood and \$6 for softwood, and made a thousand dollars profit for the municipal treasury is told in the following letter from Mr. J. T. Conway, Chairman of the Fuel Committee of Perth, Ontario. Surely this highly successful enterprise by a live town government could be repeated again and again wherever woodlots are within easy reach.

"In reply to enquiry of July 10th, re how the Perth enterprise in wood fuel was worked out I would say that we were very successful. In fact we came out nearly one thousand dollars ahead, when we only wanted to come out even.

We first bought ten acres of hardwood bush about three or four miles from Perth for five hundred dollars. When cut we had forty-five cords to the acre. Then we bought one hundred acres for twelve hundred dollars, in mixed wood, and we will have about two thousand cords off it.

We engaged a foreman and had the men driven out to the bush every morning, as many objected to staying in the bush. For hardwood we paid for cutting \$2.50 per cord and for soft wood \$2.00, and the men made good money. We paid a foreman \$4.00 per day and expenses, but we found that we could get along without him by paying \$1.25 to the best man amongst the choppers to measure up the wood when cut and allot the work to the men. We put up in the bush a large tent with a stove and benches for the men to use when eating their dinner. Also an emery stone for them to use to sharpen their axes.

We paid \$2.00 per cord for drawing. The teams made two trips each, with

a cord and a half per trip, which made \$6.00 per day for drawing.

The Chief of Police of Perth took the orders and had it delivered at \$8.00 per cord for hardwood and \$6.00 for soft wood, with a limit of two loads to each party.

After sleighing was done the men continued cutting and now we have over four hundred cords of dry wood in the bush.

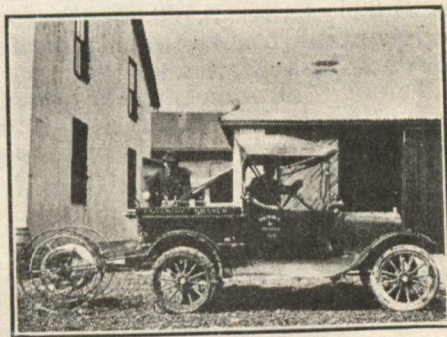
We have delivered altogether about fifteen hundred cords of wood from what we have brought in by train and from the bush, and the people of town have never been without fuel.

The great secret in keeping down the price of wood is in buying a bush near town. It is worth twice the price when a team can make two trips per day.

BUSH FIRES KILL HONEY CROP

The honey crop of the lower Fraser Valley will be one of the smallest on record, according to an apiarist at Cloverdale, B.C. Dry weather and smoke from the bush fires is given as the cause.

One of the largest producers in the Fraser Valley, who usually gathers around 200 pounds of honey per colony, says that the crop has ended so far as he is concerned.



An effective way of carrying a hose reel for a fire fighting pump. Used by the Ontario Forestry Branch at Cochrane, Ontario.

Official Estimate B. C. Timber Losses

By M. A. Grainger, Chief Forester, in a Letter to
"Canadian Forestry Journal."

Victoria, B.C., Aug. 14: The Forest Fire Season for 1918 has been, to date, one of rather moderate fire risks, with three weeks of extremely hot dry weather, which created the worst fire risk since 1910, breaking into the season during the latter part of June and first week in July. This was attended, in the Coast and Island District, with several severe outbreaks of forest fires, so that during one week alone there was destroyed a large quantity of logging machinery, camps, equipment and logs. Several thousand acres were burned over during this time of stress, which was followed by a 24 hour rain that eased conditions, and allowed the fire fighters to assume control of a somewhat serious situation.

The interior has had a fairly average fire season. Nelson has been visited with an extraordinary number of lightning fires (which do not choose the most accessible ground to start in) consequently the cost of fighting some of these is quite out of proportion to the acreage burned over, and damage resulting.

The total number of fires to date, the greater majority of which come under the heading of "no cost" fires, is 444, the cost to the Department of fighting these up to date is \$22,134.00; the acreage of cost fires burnt over is 37,836 acres. 8,700 M. feet of merchantable timber has been burned of which 3,200 M. feet are salvable.

Taking it all round, the fire season in B.C. has been one of average damage, and the present weather gives rise to the hope that the worst of the danger is now over.

The formation of a Lumberman's Association in New Brunswick, which will co-operate with the Crown Lands Department in the handling of the forests of that Province marks a new era in co-operation.

WOOD FOR ONTARIO'S USE.

The Ontario Government will have shipped by the end of the present month from Algonquin Park some fifteen thousand cords of wood for the use of the parliament buildings in Toronto and the different provincial institutions. The wood will be used in the fall and early spring to conserve coal. Some twelve municipalities in Ontario availed themselves of the offer of the government to cut wood in Algonquin Park and have taken about thirty thousand cords. It is said that a cord of wood will give as much heat as a ton of coal.

WASTING THE VALUES.

Saw-mill waste amounts to about 40 per cent of the original tree. The finished lumber, on the average, represents only from 30 to 35 per cent of the tree. New developments in the utilization of wood waste are being made continually, but it is false economy to handle waste unless the by-product industries can be carried on at a profit. Effective utilization calls for a variety of chemical and mechanical processes which must be adapted to the form, species and quantity of wood waste available at any point.—*Dr. J. S. Bates.*

In the month of August, President Wilson authorized a loan of one million dollars to the Forest Service for fire fighting expenses to meet the serious emergency conditions in the national Forests of the north west and the Pacific coast States. The loan was made from the special defence fund of fifty million dollars placed at the disposal of the President by Congress. It is recognized that the protection of the National Forests is an important and essential war activity.

Crowds Visit C. F. A. Exhibition Car

Travelling Advertisement for Forest Protection Meets with Continuous Success in Eastern Canada.

The Travelling Exhibition Car of the Canadian Forestry Association has met with great success during the first thirty days of its Eastern tour. The equipment of the car includes a handsome four-foot model of a Canadian aeroplane, a wireless set in daily operation, a number of forest telephones, two models of lookout towers, a heliograph, two cabinets of process exhibits showing the raw materials and finished products of paper and other manufactures, exhibits of unusual wood fibre products such as carpet, floor rugs, waterproof wrappings, twines, substitute for iron pipe, cellulose products and paper bandages, scores of photographs on the walls, a small forest nursery.

In addition, there will be added at Edmundston for the New Brunswick and Nova Scotia and Central Quebec runs, an automatic lantern slide projector showing thirty instructive pictures in rotation; as well as a fire fighting pump and an "Erosion Model." The latter is quite a spectacular piece of construction, 4ft. by 4ft. with two mountains modelled in cement and earth. One mountain is well forested, while the other has been denuded. An artificial shower of rain falls on both hillsides. It is caught and retained by the forested hill and delivered evenly to a rippling river. On the deforested hill, however, erosion sets in, the land in the valley is covered with boulders and sand, bridges washed out, and agricultural possibilities ruined.

During the run through Northern Ontario, Mr. Robson Black, Secretary of the Canadian Forestry Association, remained with the car explaining the work of forest protection and the need for public co-operation with the fire rangers. In the evening, a motion picture lecture was

given. Following are typical records of attendance.

Braeside, Ont.: 350 visited Car; 250 at evening lecture.

Mattawa, Ont.: 250 visited Car; 300 at evening lecture.

Temiskaming, P.Q.: 500 visited Car; 400 at evening lecture.

Timmins, Ont.: 550 visited Car; 300 at evening lecture.

Cochrane, Ont.: 700 visited Car; 400 at evening lecture.

At Cochrane, Ont., Mr. Victor Bailarge, of the Quebec Forest Service, was deputed, by courtesy of the Quebec Forest Service, to accompany the Car through Quebec as far as Edmundston, N.B., Mr. Baillairge made stops at La Reine, La Sarre, Makamik, O'Brien, Amos, Doucet, Parent, La Tuque, Quebec City, Rosaire, St. Euphemie, River Manie, Sully, and Glendyne. On the return journey points along the Temiscouata Railway in Quebec, the Quebec and Lake St. John Railway and other districts will be visited.

The New Brunswick run will take about fifteen days, the Exhibition Car entering Nova Scotia on about October 3rd.

Large quantities of special literature have been placed on the car, such as two editions of "Le bulletin des forets," "The Child's Book of the Forests," "The Forests of Canada in Peace and War" and other propagandist publications.

STATE OWNERSHIP GAINING

"If we are obliged to regulate very far private property in the interest of conservation, we have a strong ground for public property; as illustrated in the case of forests, and in this case, public ownership is the world over, gradually gaining on private ownership."—*"Foundations of National Prosperity."*

3000 Million Seedlings to Replace British Forests

By M. C. Duchesne, F. S. I., *Honorary Secretary*
Royal English Arboricultural Society.

It is estimated that by the end of this year probably one million acres of our woods—representing one-third of the total area—will have been felled for the war emergency. If this be so, and we estimate three thousand trees per acre required for replanting, this represents a supply of three thousand million seedlings

necessary for re-planting only the area which will have been felled during the war. These seedlings require three to four years in the nursery preparatory to planting in the woods. The cost of re-planting will be greatly increased if the areas are left derelict too long before re-planting.

Ways of Research and Crickets

A problem brought to us several years ago was to avoid the destruction of binder twine by crickets, recounts the "Little Journal" of Cambridge, Mass. The twine was perfectly good except for the fact that as soon as it was put to use in the harvest field the crickets straightway destroyed it. Efforts had been made to destroy the crickets but without success, and do what they would, they couldn't keep them out of the twine as soon as it reached the stubble. It was a matter of really grave importance, and finally we were called upon to undertake research in the matter. The problem was given to a chemist of unusually ripe scholarship. He was joined by a competent entomologist and they proceeded to work in the laboratory with crickets imprisoned in glass houses and, for months at a time, in the harvest fields where crickets live. Soon they reached the conclusion that it was not twine for which the insects had an insatiable passion; it was their hatred of the situation which followed the reapers in the stubble. It appeared that they bit into the twine possibly for moisture which was dried out of the wheat stalks, or for some other insectivorous reason consequent upon

changed conditions. The solution lay in discouraging the attacks, rather than in killing the fiddlers after the sheaves were loosened. Men of research are out after results, not revenge. The next step was to find something that was more unpleasant than lack of shade, more offensive than drought, more horrid than thirst from the crickets' standpoint. Research and experiment finally proved that a simple treatment of the twine makes it, cricketally speaking, unendurable and thus were accomplished great savings in wheat as well as twine. The work took several seasons with the checking up of each promising laboratory experiment in the open. Theory and practice must go hand in hand. Moreover, research means headwork, and sometimes field work.

It is estimated that the sunflower plant draws from the soil and exhales in 12 hours 12 gallons of water.

N.B. BUILDING TOWERS.

The construction of observation towers to be used in the fire fighting system of New Brunswick will be begun shortly.

War's Terrible Drain on Europe's Forests

By Col. Henry S. Graves, Chief Forester of the United States.

If ever an argument was needed for forestry, it is found in France. Its forests, developed by many years of care, are available and usable now in the hour of supreme need, which shows the value of French forestry in the past. It has been very carefully administered. Prior to the war, France imported much of her timber and had many little mills throughout the country to supply local needs. This combination kept prices down, and the general market has been supplied by importation. When, therefore, need suddenly arose to provide timber and fuel, not only for the French people and the French army but also for the tremendous needs of the American army, France was ready.

Drained of Timber.

France and England, too, for that matter, are going to be well drained of timber by the war. It will take them a long time to recover their neglected forests. France will have to import. England will have to import. Norway and Sweden are reported to have been cutting rather recklessly, so that they may not be able to continue their exports of timber. It is said that 15,000,000 acres of forest in the Baltic Provinces have been practically ruined by the fighting between Germany and Russia. Germany has begun already to exploit the Russian forests and indeed had begun to do so before the war.

An enormous amount of timber will be needed after the war for reconstruction. This country is likely to be called upon, and we have not in this country any too extensive supplies, nor have we been handling them with too great regard for the future.

The situation in France is about as follows:

From the Pyrenees Mountains to the city of Bordeaux is a great pine country (Maritime pine), which with

our own pine forests provides from 75 to 90 percent of all the turpentine used. This great plain reminds one of Georgia. In places 85 percent of the land is covered with forest. It is held by private owners usually in large holdings. The methods of extracting turpentine are much more careful than ours, and as a result the trees live many years longer. Clean cutting is usually practiced over areas of twenty-five to fifty acres together. In France they see that the woods come up again to pine. The new forest is started promptly by the private owner. Under war conditions owners in America will do this to a much greater extent than hitherto.

Every Tree Paid For.

South of this pine belt, the French Government owns considerable tracts of land mostly planted to pine along the coast. In the rest of France (45 percent of the country) the forests are mostly on private estates and have been carefully handled for many years. It is in most respects the same as our wood-lot problem. Here, too, French Government foresters mark and measure the timber for cutting. The timber for the American army is purchased from the Government and from the owners of the estates, and it is a new condition that our lumberjacks have to meet when every small tree destroyed is paid for, whether it can be utilized or not. Our men have been doing splendidly well, and the French themselves are delighted with the methods and results.

One of the great points in this war is the generosity of the careful French people in opening up their forests. The French people are suffering for fuel and timber supplies of all kinds, and yet when the American army had need of enormous quantities of railway ties and piles and of lumber for the construction of warehouses and

other buildings the French said: "Get them here."

Our Part in Restoration.

When I went to France in 1917 Canadian skilled workers had already done much good work. We now have there about 9,000 skilled Americans and seventy or eighty sawmills, portable, of all sizes, scattered over central and southern France. The spirit of our men is wonderful. They get 30,000 feet per day from a 10,000-

foot mill. The French have had to cut their picturesque highway poplars but we are seeking to leave no scars in France. The forests are not only paid for, but also they are going to be reforested. Scotch and English forest officers have already said that the work is being well done. I should like to see American engineers leave the roads and the smashed forests and even the fruit trees of France all replaced. Let us take part in the restoration.

How France's Forests Have Increased Population

By Gilbert Brown, Royal Scottish Arboricultural Society.

I have been for fourteen months in France in connection with the exploitation of French forests for the production of timber for the armies. My appointment by the War Office was as liaison officer with both the French military and forestry authorities, and I had singular opportunities of seeing something of the great part played by forestry in French national life. My duties took me to the splendid virgin forests of silver fir and spruce in the Jura, to the great State and privately-owned oak and beech forests of Normandy and the middle of France, and—perhaps more interesting than any other forest area—to the Departments of Landes, Gironde and Basses Pyrenees in the south-west corner of France. During the last 100 years this country has been converted from a barren waste of utterly unprofitable land to a huge forest of over two millions of acres, all under crops of maritime pine of varying ages. Had it not been for the foresight of the French authorities, and perhaps of Napoleon III. in particular, the armies and railways to-day in France and our Admiralty collieries in South Wales would have been in much dire need of timber than they actually are.

This south-western area of France, which is now so enormously pro-

ductive of useful timber, supports in its villages and small towns a thriving population, said to be more prosperous than any in France; they owe that prosperity entirely to the products of the forest. Certainly resin plays no inconsiderable part in this increment of wealth, but in spite of the distance from coal-fields, great sums of money pour into the country annually from the tens of thousands of tons of pit-wood shipped away, and the hundreds of thousands of sleepers produced by the excellent moveable band sawmills scattered up and down the length and breadth of the three departments. You cannot go through that country without picturing to yourself what a lonely wilderness of heath and peaty marshland it would have been had its general afforestation not been taken in hand. There is no brighter prospect that afforestation in Scotland has to offer than the thought that in years to come we, or at any rate our children, may see a great rural population springing up among our valleys in prosperous and sheltered small-holdings, with ample occupation for their families and work for their horses; the hillsides around them clothed with thriving young timber up to tree-growing limits of altitude.

N. B. Changes Plan of Selling Timber

On about 400 miles of timber lands in New Brunswick the licenses of which expired in August last, the Government of the province has decided to put the lands up to competitive bidding on the basis of a straight stumpage rate per thousand superficial feet, the upset price of which will be announced at the hour of sale. The announcement is the more unusual as these lands had been

advertised for sale under the traditional yearly lease plan, the Government cancelling the advertising at the last moment.

Whether the change of policy will be extended to cover all future disposals of Crown timber is not stated, but the success of the plan from the points of view of lumbermen and provincial revenues will be watched with much interest.

N. B. Chooses Rangers on Merit Basis

It is a common impression that fire ranging, as controlled by politically-appointed governments is fated to carry a heavy load of personal incompetents. New Brunswick, however, promises to overcome this inherent flaw through the services of the new Forestry Board, on which the non-partisan voice of representative lumbermen should neutralize any politician tendencies that might upset efficiency. This Board recently held examinations at which 139 applicants presented themselves. Of this number 63 passed the tests. The New Brunswick Forestry Division is thus commencing its ranger appointments on a strict merit basis and laying sure foundations for economical expenditure and well-disciplined service.

Mr. L. A. Gagnon, the present chief game warden, is to be continued and in addition will supervise the work of the different inspectors in regard to the work of game protection.

Mr. A. T. Murchie, the present chief scaler, will superintend the work of the whole province in regard to scaling.

Inspectors are appointed to check the scale and to supervise rangers in regard to scaling, fire protection, and game protection for new districts.

The new districts and inspectors are as follows: Districts one to seven, inclusive, Restigouche County, Arthur C. McElveney, inspector's headquarters at Campellton. Num-

bers eight to fifteen, Gloucester and Northumberland Counties, E. A. Roberts, inspector headquarters Bathurst. Districts sixteen to twenty with twenty-five portions of Gloucester and Northumberland Counties, headquarters at Newcastle, with M. A. Craig as inspector. Districts twenty-one, twenty-two, twenty-three, twenty-four, twenty-six, twenty-seven and thirty-one, including portions of Northumberland, York, Queens and Kent Counties, headquarters at Chatham, inspector Wm. Kerr. Districts twenty-eight to thirty-six, with the exception of number thirty-one, embraces portions of Madawaska, Victoria, Carleton, York, Charlotte, St. John, Kings, Queens and Sunbury. The inspector of this district is Mr. Geo. F. Burden, ex-M.L.A., whose headquarters will be in this city.

The large number that did not qualify was due to the fact that considerable numbers of the applicants presented themselves for examination that had not sufficient previous experience in scaling.

A considerable number of the 63 were ruled out as being over the age limit of 55 years; also a number declined to accept yearly work, preferring to work only in the winter.

In order to pass the examinations, candidates were obliged to stand practical tests written and oral, in logging, scaling, cruising, surveying, fire and game protection and ability to prepare reports.

A Proper Safeguard in Tree Planting

By the Editor of the "National Nurseryman."

If the truth were known, after being transplanted, many trees fail through the action of the wind. If the top sways ever so little it is reasonable to suppose that almost every root and little fibre moves at the same time. Under such conditions the tree cannot establish itself, as absolute stillness is necessary for the roots to fulfill their functions. The delicate cell walls of the rootlets cannot take up the moisture and food from the earth where there is the slightest motion.

Expert practical gardeners have long recognized this and take means to prevent movement by staking, cutting back the tops, firm planting and other methods. With large or even medium-sized trees it is not easy to overcome the effect of the wind, especially if the tree stands alone in an exposed position.

A stake cannot well be driven down firm enough to be of much

value; besides, it usually chafes the bark and is in other ways objectionable. Three guy wires fastened around the tree three-quarters of the way up the trunk, and fastened to stakes in different directions, is a very effective way of holding the tree steady until the root system anchors it. Care must be taken to prevent the wires from cutting the bark. This method is not always feasible.

A good plan that might be practised more to advantage with fall-planted trees is to pile soil around the trunk to the height of two or three feet and leave it there over winter, removing it in the spring. This practice has much to recommend it when it can be done without looking too unsightly. It not only steadies the trees, but keeps the frost away from the roots to a certain extent. But do not fail to remove it about April, or its action will be detrimental rather than otherwise.

Stock-taking of Canada's Timber

Owing to the tremendous consumption of timber, lumber, pulp wood, etc., during the last few years, the exhaustion in the near future of Canadian forest resources can no longer be regarded as a negligible prospect. This situation led the advisory board of the forestry branch of the Department of the Interior to make, in January, 1917, an analysis of the existing forestry situation. In order to meet this situation, it was evident that certain regulative measures would have to be adopted, but it was equally evident that such measures should have to be based on definite scientific information, little of which was available at that date. In order, therefore, to obtain a scientific basis

for future remedial measures and also to curtail present wasteful methods, the advisory board of the forestry branch drew up the following recommendations.

(1) That the stock-taking of the standing timber of eastern Canada should be completed.

(2) That a quick reconnaissance survey should be made on the condition of cut-over lands.

(3) That a study should be initiated of the possibilities and successful methods of securing reproduction of the more important timber trees, especially white pine and spruce

(4) That an early determination should be made of the rates of growth, in volume, of the important

timber trees, both individually and in forest stands, to permit calculation of possible quantity of reproduction. This work would include the construction of volume tables.

In discussing these recommendations, it should be pointed out that some of this work has been done, both in Canada and elsewhere. For example, the Commission of Conservation has completed valuable investigations on the timber of British Columbia and Nova Scotia. The study of the rate of reproduction etc., of trees in Europe has also been undertaken, and in the United States certain investigations have been made on similar topics for American trees. As regards the species that are common to the United States and Canada, the results obtained by American study would, of course, be partly applicable; but it must be remembered that climatic and soil conditions of Canada, owing to its higher latitude, are factors that render rather uncertain information derived from investigations carried on abroad.

In consequence of the recommendations made by the advisory board of the Department of the Interior, the director of the Forestry Branch brought the matter to the attention of the Research Council. It was proposed that these investigations be made on the Petawawa Military Reserve, a part of which, only 25 square miles in extent, is used for military purposes, the remaining 80 square miles being therefore available for forestry studies. This is part of an old cut-over timber district, on which a second forest has begun to develop, and the timber on it at a stage of growth that renders it suitable for the proposed study. Recognizing the importance of the subject, the research council recommended that a grant should be given to carry out the investigation during the summers in 1917 and the following years. Consequently, in August, 1917, a preliminary survey was made on the reserve by a forest survey party and valuable results were obtained. In May, 1918, the work was recommenced and is now proceeding satisfactorily.

Canada and the "Idea of Science"

"This question is one of paramount importance to Canada in view of the intensified application of science to industry which elsewhere will be fostered after the war by the State, and also through private enterprise. It has been ascertained that not two per cent. of Canadian industrial concerns have research laboratories and only about ten per cent. have routing laboratories, chiefly for the elementary testing of materials.

"The provision for research, either in pure science or in science applied to industry, has been and is utterly inadequate to our needs, and unless vigorous action be taken, and soon, to reorganize our industries on scientific lines, wherever possible, Canada will face a very serious industrial crisis in the years following the war.

The annual budget of the Massachusetts Institute of Technology exceeds the total of the annual expenditure of all the Faculties of Applied Science in Canada."—*Dr. A. B. Macallum, Chairman Honorary Advisory Council of Scientific and Industrial Research.*

PULP AND PAPER ON TOP.

Canada now has a total of 90 pulp and paper mills, many of which are large and of modern design. The export figures for the calendar year 1916 show that pulpwood, wood pulp and paper have increased to nearly half of the total export value (approximately \$100,000,000) of all forest products with the exception of the small proportion of specially manufactured articles.

A County that Values its Woodlands

A unique project in woodland conservation has been brought to a successful issue at Conestoga, Ontario, in the heart of a highly developed industrial and agricultural section. On August 28th, at a gathering of representative men of the locality and of Ontario and Federal Governments, Mr. Walter J. Snider of Conestoga, formally handed over to the Forestry Branch of the Ontario Government the supervision of 40 acres of wooded river flats lying at the confluence of the Grand and Conestoga Rivers. The property has been in the possession of Mr. Snider's family since 1850. Many of the trees are of great age and majestic in size and form, the whole woodland being regarded as one of the most attractive beauty spots in all Canada. Mr. Snider's action transfers to the Ontario Forestry Branch the management of the tract, any cutting to be done according to plans of the Chief Forester and provides that upon the removal of any trees a proper number of seedlings shall be planted. There is considerable room for tree planting in the grounds at present. In the words of Mr. Snider's letter to the Minister of Lands and Forests at Toronto, "this would provide a forestry and reforestation demonstration on a small scale right in the heart of the older portion of Western Ontario." The Minister accepted Mr. Snider's valued offer and promised to bring in the required legislation at the next session.

The meeting at Conestoga was attended by Hon F. G. MacDiarmid, Minister of Public Works, representing the Ontario Government; E. J. Zavitz, Provincial Forester, Clyde Leavitt and A. V. White for the Commission of Conservation; Homer Watson, President, C. Dolph, Secretary and D. B. Detweiler,

Chairman of the Committee, of Waterloo County Grand River Park Ltd; Dr. A. S. Vogt, Director of the Toronto Conservatory of Music and Dr. Fraser, Provincial Archivist; Mr. Orpheus Shantz, Chicago, a leader in conservation work, and many others.

The enthusiastic interest shown in the question of woodland preservation by the people of Waterloo County is not confined to a single illustration. In 1913, when it became known that a piece of lovely woods known as Cressman's Bush, on the banks of the Grand between Doon and German Mills was about to be sold at public auction and probably handed over to a portable saw mill, a group of public-minded citizens banded together as "Waterloo County Grand River Park, Limited" and with no anticipation of personal profit bought Cressman's Bush. This has since been preserved as a public recreation ground. With the Conestoga property it will form a very beautiful public estate, a great asset to the county for all time to come, and an increasing attraction to outside visitors.

The point of interest that rightly appealed to several speakers at the inauguration ceremony at Conestoga was that the public concern, as there manifested, in the perpetuation of a beautiful and useful woodland would be certain to prove contagious in other parts of Canada. While the forest lands proper, in the less settled parts of Ontario, were under direct Government care, the woodlot in the older sections had been permitted as a rule to deteriorate or disappear. This was bad economy from every point of view, in which aesthetic considerations were by no means to be disregarded. The power of an actual example such as the Conestoga and the Cressman conservation projects, will have a stimulating effect upon public sentiment wherever the enterprise becomes known.

Canada to Profit by Forestry Corps' Experience

Sir Robert Borden, since his return to Canada has been speaking before important gatherings as to Canada's responsibility and duty at this time. In his address at the Central Canada Exhibition in Ottawa on Sept. 9 he dealt particularly with conservation of time, money, and natural resources. On the latter point he is reported as speaking as follows:—"The war, the Prime Minister said, would teach many other lessons. He had reason to believe that men serving in the Forestry Corps in Great Britain and France would come back to Canada with new ideas as to forest conservation, and especially as to reforestation. Much has been said during recent years on this subject, but practical object lessons are usually much more effective than the written or spoken word.

"There must be an avoidance of waste in all departments of national activity by Federal, Provincial and Municipal Governments. That could only be accomplished by the cultivation of a healthy public opinion, and by the realization of the same purpose by the people in their own personal affairs. The burdens of the country would be great, but, compared with our resources if properly developed, they would not eventually be serious. The country's resources were enormous and they must be conserved as far as possible for the benefit of the whole people. In order to conserve it was not necessary nor desirable that resources should lie idle; they must be developed in the interest of the people and not exploited for individual profit.

Wireless Telephone for Forest Patrol

(By an Officer of the Marconi Wireless Telegraph Co.,
Montreal.)

"If the transmission of telegraph signals through space is wonderful, how much more marvellous, seems the carrying of human speech across the world without aid of wires! And yet the problems presented in achieving this result were purely mechanical ones. Wireless, or more properly *radio-telephony*, has been the subject of experiments by the Marconi Companies in England and the United States for several years, and like aviation and other sciences, has made particularly rapid strides during the present war. The big U.S. naval wireless station at Arlington, Virginia, has already been in conversation with the Eiffel Tower, France, and with a station at Honolulu, and it should be noted that in this and other long distance radio-telephone experiments, the voice was

heard remarkably clear without the "buzzings" due to line trouble frequently affecting the ordinary telephone. It is obviously impossible to divulge information which must be necessarily kept secret in war-time but it may be stated that wireless telephone installations are being employed by certain of our Allies for communication over a distance of sixty miles between aeroplanes, the same apparatus being adaptable to wireless *telegraph* communication over twice that range. The advantages of such a dual system are well worthy of consideration by those interested in the question of forest fire control, and should not be overlooked."

The wireless telephone will be manufactured in Canada after the war, the Canadian Forestry Journal is informed.

Why Forests Pay Better Than Mines

(By D. E. Hutchins, late Conservator of Forests, South Africa.)

The forests of New Zealand are, after the climate, the best natural asset possessed by the Dominion: they have escaped development solely because New Zealand has been developed by men coming from a country where there is no State forestry. Forestry is a technical subject, and the value of any forest has to be appraised by professional men who make forestry the business of their lives. The value of New Zealand forests has lain hidden for seventy years, one might almost say, as were the South African diamonds for two hundred years.

The coalfields and goldfields have been examined by engineers and geologists. If a fraction of the development that has been put into coalmines and goldmines had been bestowed on the forests they would

now be more valuable national assets than the coalmines and goldmines put together. Thus the New Zealand coalfields have produced up to date a total of £22,610,067 worth of coal and coke. With a proportionate attention to forestry with no appreciable loss to other industries, nothing more, in fact, than a very little poor grazing (of which much has already gone back to scrub, gorse, and other noxious weeds), the forest industry could have produced this total value of, say, £23,000,000, in two years, if only the home market, the larger part of the Australian, and a small portion of the two other timber markets in the Southern Hemisphere had been filled. Ordinary attention to forestry thirty years ago would have enabled New Zealand to do this in part now, and later altogether.

Australia Demands Trained Foresters

(Australian Forestry Journal.)

It is essential even at this late hour to develop the forest wealth of Australia and to utilize it, not only to-day, but hereafter for all time. New South Wales has made a good start with its Forestry Act of 1916 and the declaration of a definite "forest policy." Queensland, Victoria and Western Australia are moving in the same direction, and after many years of neglect and waste the ruling powers have awakened to a realization of the wickedness of past indifference. The prospects of improvement in forestry matters and the contingent influence upon every branch of the timber trade in Australia are now good. But the harvest will not be ready for reaping next year, nor the year after. If the value of the forests is to be realized to the full, those forests must be preserved and cared

for in such a way as to permit of current supplies being available when required, without causing deterioration in the worth of the standing crop from which future demands must be met—for the usefulness of a properly conserved forest will continue for all time, and should increase.

But the passing of Acts of Parliament will not of itself ensure the best utilization of the huge asset contained in the forests of the Commonwealth. The expenditure of large sums of money will not give us adequate return, unless, throughout the Forest Services of the several States, we have complete efficiency. Forestry is a science, and the forester must be a skilled man—a specialist. The time is no more when the application of practical and local experience brought a full harvest from the forests. It is not sufficient

that a forest worker—of high or low degree—should be able to distinguish between a hardwood and a soft-wood tree and tell the peculiarities of each. He must be a man of attainments in forest science.

B C. Air Patrol Scheme Not Abandoned

(Vancouver Province.)

FLYING BOAT MEETS MISHAP.

Vancouver, Sept. 4.—While flying at a height of about 1,000 feet this afternoon, Lieut. V. A. Bishop, who was testing a hydro-aeroplane recently built for forestry patrol by the Provincial Government, fell, landing squarely on top of the residence of Dr. J. C. Farish, in the main part of the west end of the residential district. The impact of the fall dislodged the engine, which went crashing through the upper story of the house, with Lieut. Bishop following it, into the bathroom. Lieut. Bishop was said not to be seriously injured.

The mishap at Vancouver in which the hydroplane built for the use of the Forest Branch of the Department of Lands was wrecked, is deeply regretted by Hon. T. D. Pattullo, Minister of Lands, who returned to the city yesterday afternoon from a three weeks' trip to Prince Rupert and who was expecting to have the air machine brought to Victoria shortly, when, it was planned, a formal ceremony inaugurating the first air forest protection service would be held.

Last Thursday the machine was tested by Flight Commander Mackenzie, who stopped off in Vancouver, while en route back to England to resume service with the Royal Flying Corps, and Flight Lieutenant Grant, both of Victoria. Some time previously Flight Commander Mackenzie had given the machine a test, when certain defects developed which were remedied and the flights last Thursday were in the nature of final tests. Four flights were made, Mr. Caverhill and one of the Forest Branch employees going up as passengers. These flights were apparently satisfactory and the machine was declared

by the two experts to be generally sound. On the strength of that report arrangements were made with the Hoffar Bros., Company, which manufactured the plane, to take it over, Mr. G. R. Naden, Deputy Minister of Lands, who witnessed the tests, officiating for the department.

Government Leased Machine.

The machine, which cost between \$7,500 and \$8,000 to construct, was not purchased outright by the Government, but was leased for a year, the Government stipulating to keep it in repair for a period of two and one-half months. Hon. Mr. Pattullo stated last night that the Government would pay for the damage done to the machine yesterday as well as for repairs to the dwelling upon which it fell.

Keen regret at the accident was expressed by Hon. Mr. Pattullo, who has taken great interest in the inauguration of an air service as an adjunct to the forest protection system. It was a unique departure, but one which, because of the proven adaptability of the airship for commercial uses and the certainty of the future use of flying machines in many lines, was bound to prove most valuable.

The Minister stated that such a service would prove most effective in that an air machine would be able to cover a great extent of territory, and by reason of the height to which they could go the observer would be able to keep watch over a great area and promptly ascertain the first signs of an outbreak of forest fire. The utilization of the airship method would necessitate considerable preliminary work in the way of organizing the service, and it was planned to carry on this work this winter, so

that when the danger period arrived next year, the service would be in full working order.

Prospecting From Aloft.

As illustrative of the interest which is being taken in the plan of the Department, Hon. Mr. Pattullo, stated that on his recent trip to the North, he met many prospectors who advocated such a plan in connection with prospecting for minerals. They pointed out that undoubtedly in the near future, in view of the vast strides being made in aviation in commercial pursuits, it would be feasible to use flying machines in reaching inaccessible spots at present lacking other means of ingress and egress. The department was building its hopes upon using such machines in topographical and surveying work, and in connection with the prosecution of the investigations of the water branch. The commercial possibilities of flying machines, the Minister said, have no limit.

The machine, the government arranged to secure, is what is known as a flying boat as distinguished from a sea-plane equipped with pontoons. Flying men who have had active experience with air machines claim that the flying boat is not a satisfactory type, in fact, they say for use in this province, where mountain ranges exist and the difficulties of landing are thereby increased owing to the limited space within which to do so, the type of boat which met with the mishap yesterday is not as satisfactory as the sea-plane type now in use in the naval air service overseas.

A local flying man who has seen extensive service overseas in the seaplane service in England, and who is experienced with the best types of machines used for water service, stated yesterday that the flying boat design of the Vancouver machine has the engine behind the head of the pilot, and such an arrangement is not as well adapted for flying conditions as the tractor machine with pontoons, such as are the British naval machines. The latter have

the engine in front, and while the range of vision is therefore, somewhat circumscribed, on the other hand, they possess a better driving angle, that is, they give a greater distance within which the machine may descend. In the boat at Vancouver the angle at which it can be brought down is steeper and in a mountainous country that is an unsatisfactory matter and renders operation less safe for the pilot.

BY-PRODUCTS AND VELVET

The Hercules Powder Co. obtained a great contract for explosives provided they bought no acetone, which is scarce and needed for munitions. Under intense research they found they could make it by fermenting kelp. In February, 1916, they broke ground, and by the fall of that year had their \$5,000,000 plant in full operation. Besides acetone the kelp yields potassium chloride and new solvents greatly needed in industry. It is a great thing to have by-products useful, and if they are not, to make them so.—*From the Little Journal.*

WHY DOES SAWDUST SINK?

From American Lumberman

Can you explain why the sawdust even of the lighter woods always seems to be heavier than water?

Even the lightest of known woods is actually heavier than water and floats only because of the air contained in its cells. The actual wood structure of all woods, exclusive of the air in the cells, does not vary greatly in specific gravity. Sawdust is in such form that the air in the air cells is easily lost by replacement with water and when this occurs the sawdust sinks.—Editor.

From Saint John West, N.B.

"Your publication is an excellent one and is getting better all the time. I wish it were more extensively read as I am sure it would prove an educative force much needed in this part of the country at least. Wishing you every success in your grand undertaking."
E.R.W.I.

Tuning Up the Forest Yield

The success of the newly organized Woodlands Section of the Canadian Pulp and Paper Association is as certain as sunrise. No time serves as well as the present to throw off the household religion of Canadians that national wealth comes from "choice lots." No time like now to take on the conviction that the prosperity of this country must be derived from its basic resources and then only when those basic resources are coupled to progressive brains.

Of the hundreds of millions of foreign capital poured into Canada, surprisingly little has gone thus far into industries of other than secondary nature. That has had its compensations for we are now in possession of a remarkably-advanced national plant in point of transportation, city development, etc., so that when the big job of developing agriculture, forests and fisheries is taken on seriously, progress is bound to be unprecedentedly rapid.

Since we have turned attention to the natural resources as the logical route to future progress, we face at once the need of coupling to farming, forestry, mining and fisheries, the same scientific calculations that have held good inside the walls of the factories, although there does seem to be a downright shyness of giving science that much rope.

Those who know the Canadian fisheries best state that the "practical" man's indifference towards improved methods of curing and packing has resulted in our having fewer Canadian fishermen than in 1880. We have the Commission of Conservation's authority for the assertion that the productivity of the farms of Canada can easily be doubled without occupancy of more land. The same must hold true of the forests which investigations show are not producing at half capacity. This may not be the fault of the "practical" man, but it certainly cannot be laid at the door of the professional Forester, as director of logging operations.

\$20 PROFIT ON SEASON'S CUT.

How would you like to put up the cash for a \$100,000 incorporation for the purpose of taking a contract on which your total profit was fixed at \$20 for the year? That is precisely the attractive business prospect which led to the organization of the Aircraft Lumber Co. of Olympia, Wash. An even score of loggers, practically all in that district, have formed this concern and put up \$5,000 capital each for the purpose of taking a contract of that sort from the Government for airplane spruce. The contract with the Government specifically provides a basis of cost plus \$20 a year. The new company expects to produce 10,000,000 feet of selected spruce yearly.

FIRE ENDANGERS LIVES

Powell River, B.C.,—The recent bush fires on the limits of the Myrtle Point Logging Company at Powell River and also on the Lamb Lumber Company's limits were the worst in many years and the witnesses testify to many narrow escapes from burning to death of employees who stuck to their homes and employers' equipment to the last minute, trying to save them. On trying to reach camp by locomotives the men were cut off and had to abandon these and dodge the waves of burning slash. Among these were several women and children and it is considered miraculous that all reached the lower camp in safety.

Many lost their all in the homes left behind and the company's loss figured up into many thousands of dollars in houses and equipment.

For some years, however, this burned over area will be a protection to the surrounding country and standing timber at the north.

The Forestry Journal will be sent to any address in Canada for One Dollar a Year.

Golden Returns from Forest Maintenance

By D. E. Hutchins, in "The Forests of New Zealand."

I estimate the European and Southern Hemisphere timber markets open to New Zealand as worth now £14,000,000 yearly; and these markets are more likely to improve than fall off, because all statistics show that with civilization and industrial progress, although wood is replaced for many uses, the net result is a greater demand for wood. *In the Kauri tree New Zealand has probably the most valuable timber tree in the world.* Its timber is unsurpassed by any other in the chief timber markets of the world. It grows nearly twice as fast as European timber trees, and where it is now deficient in the forest it can be interplanted to a full stock at about the cost of grassing. My investigations have shown that it is seemingly the largest timber-yielding tree in the world, taking recorded dimensions of the historical trees in the Tutamoe forest. It is not quite so thick or so high as some other giant trees, but it cubes larger than they do, on account of the small amount of taper in the trunk.

Living would be appreciably cheaper with abundant timber and firewood at people's doors. There is a firewood famine at present in New Zealand, firewood near most of the industrial centres being as dear as good sawable timber in Europe while a timber famine is rapidly approaching. New Zealand at present is being stunted and starved in one of the prime necessities of civilization—timber and firewood. The present use of timber in New Zealand has become restricted to an average of only 25 cubic feet per capita, while the United States has a yearly consumption of 160 cubic feet timber and 96 cubic feet firewood. Germany with a large population on a small area, has a yearly consumption of 19 cubic feet timber and 18 cubic feet firewood, thus releasing a large

surplus of coal for exportation. Other countries, excepting England, show similar figures. New Zealand with its comparatively small population is already importing half a million pound's worth of timber yearly, and much coal.

The millable forests of New Zealand contain over double the timber per acre of the great national forests of the United States of America, covering an area of over twice the total land area of New Zealand.

The market value of New Zealand timber in the forest is now nearly double European prices; and the growth of the trees, if the forests were cultivated as in Europe, would probably be about double the growth of European timber trees.

STUDIES IN PULP FORESTS.

The study of the cut over pulp wood lands undertaken last year by the Commission of Conservation, with the co-operation of the Laurentide Company, Ltd., is being continued this year and the co-operation of the Department of Lands and Forests of the Province of Quebec and of the Riordon Paper Company, Ltd., has been obtained. The final results of this work will show just what the future has in store and give a working basis for the intelligent formulation of working plans and proper utilization of pulp wood lands so as to insure a perpetual supply. The whole subject is a matter of practical common sense and sound business judgment. This is demonstrated by the fact that two most successful paper companies are taking the greatest interest in this investigation, showing that the policy of looking to the future, which has made them successful, will now be applied to their forest properties.

Sixty-one million out of the 121 million acres which make up Spain's area are mountain and waste land.

The French Forest Service

Taking the State and communal forests together, there is an area of rather more than 7,000,000 acres under the charge of forest officers of the State. The composition of the active Forest service is as follows:— There are 32 Conservators of forests, one for each of the 32 administrative districts into which France is divided. There are 200 Inspectors of forests, 215 Assistant-inspectors, and 300 *gardes generaux* or Superintendents. The duties of Conservators are clearly defined. They do not include questions of policy, which are dealt with by the Central Administration

but they give the Conservator a free hand within his own area in certain clearly defined matters. The Inspector is the executive officer for a limited district; associated with him there is an Assistant-inspector who replaces him when absent, and is essentially an out-of-door official. The Inspector and Assistant-inspector are charged with the execution of the working-plans under the direction of the Conservator of the district. All the officers of the Forest service receive their training at the Forest School at Nancy.

Director of Forestry Seriously Injured

Mr. R. H. Campbell, Dominion Director of Forestry, was seriously injured while on an inspection trip on the line of the Hudson Bay Railway on Tuesday night, Sept 10. Mr. Campbell, who had been away from Ottawa on his annual inspection trip to the Pacific coast for about two months, had reached Manitoba on his return trip when the accident occurred. With the district inspector for Manitoba, Mr. F. K. Herchmer, and some rangers, he was inspecting the country along the Hudson Bay Railway near Pas, Manitoba. The party were riding on a gasoline "speeder" or light car used for inspection purposes. In returning to Pas after nightfall the speeder overtook and collided with a handcar upon which there was no light. Mr. Campbell and Mr. Herchmer were thrown from the car and Mr. Campbell unfortunately struck his head while Mr. Herchmer escaped with a severe shaking up. Mr. Campbell was promptly conveyed to the hospital at Pas four miles away where his wound was dressed and where he was later attended by a specialist sent from Winnipeg. The specialist decided that his condition was such that he could

safely return with him to Winnipeg where he arrived on Friday evening, Sept. 13. Since that time the reports of his condition have been of a most encouraging character and at time of writing his progress is considered satisfactory by his physicians.

Others riding with Mr. Campbell received minor injuries, the only serious other case being a broken leg sustained by one of the rangers.

BORERS IN SPRUCE.

"It is reported that a borer has appeared on the south shore of the St. Lawrence River which is doing quite a lot of damage to the spruce. The Quebec Limit Holders Association has asked the Quebec Forest Protective Association to investigate and see what steps can be taken to combat the pest. The Dominion Entomologist is said to have stated that this insect breeds on the logging debris. If this is the case, steps must be taken to dispose of this by fire at the time of logging."—*Ellwood Wilson in "American Forestry."*

Reports reaching the Canadian Forestry Journal claim that the borers have also appeared on tracts where no logging debris exists and were doing great damage.

\$4,000,000 Yearly for Forest Upkeep

Washington, D.C.—Receipts from the National Forest on the fiscal year 1918, ending June 30, exceeded those for 1917 by almost \$120,000 and totalled over \$3,574,000. The increase does not come up to the big increase of the year before, which was more than \$600,000, but still shows a healthy growth in most lines of business on the Forests. The cost of operating the Forests was about \$4,000,000, and was practically the same as in the previous year. This is exclusive of the additional expenditures caused by the very serious fire situation and for which a special

deficiency appropriation of over \$700,000 was made by Congress.

This year's increase in receipts, according to the forestry officials, came mainly from the larger number of livestock grazed, although every revenue producing activity on the forests except timber business and permits for water power contributed its share. The timber business fell off in consequence of the general let-up in private building activities on account of the war, the dislocation of transportation facilities during much of the year, and the labor situation, especially in the northwest, where the timber business is ordinarily largest.

Eastern Forests Producing Poorer Wood

By Ellwood Wilson in "American Forestry."

The writer has just been making rather an extensive tour of the saw-mills of New England and Quebec, and has reports from New Brunswick and Nova Scotia. He has been struck anew with the view point of the saw mills that quantity production is the only end sought. The waste is very large, although steps are being taken at many mills toward

closer utilization. The quality of the trees left in the woods is growing poorer and poorer and this makes the output worse. The supplies of soft wood are dwindling rapidly and it is high time that the whole question of our future supply should receive careful study and a plan worked out for the future.

Jail for Endangering Forests

The courts of Quebec are vigorously punishing settlers and others who disobey the forest protection laws in neglecting to take out burning permits, and for other causes.

For leaving his smudge fire unextinguished, thereby endangering the surrounding forest, Ovila Melancon, of Ste. Anne du Lac, P.Q. (Tapinee River) appeared before District Magistrate C.B. Major, at Mont Laurier, P.Q., on the 22nd ult., and was fined \$30.00 and costs.

For burning slash without a written permit from a fire ranger, Hermidas

Lussier, Ferme Neuve, P.Q., appeared on the same date, and was fined \$25.00 and costs, or eight days in jail. He chose the latter and spent eight days in the district jail at Mont Laurier.

Antoine Pichette of Val Des Bois was fined \$25 and costs or three months in jail by Judge Goyette at Hull, Sept. 9th for setting fire to his slash without a ranger's permit. Paul Dubec, High Falls, for a similar offense, was given an equal fine. Both paid the money and were given their freedom.

"The Child's Book of the Forests"

In conformity with the Forestry Association's plan to direct its educational work as much to children as to adults, ten thousand copies of "The Child's Book of the Forests" (illustrated) have been printed for free circulation in Ontario, and ten thousand of a slightly different book in French called "Petit Catechisme de la foret." These will be made use of by school teachers, clergy, etc., and the main edition will reach the children of forested regions through the fire rangers.

In the back of each booklet is a pledge reading: 'I hereby pledge myself to do everything in my power to prevent forest fires from starting,' with blanks for three names, and the address of the nearest fire ranger. The latter space will, of course, be filled in before distribution.

Adult readers may be struck by the very rudimentary questions asked and answered in the booklet, but experience has shown that these are the actual stumbling blocks on which much ignorant prejudice against forests, fire ranging, and limit holders has been founded. The "Child's book of the Forests" was written by Mr. Black, Secretary of the Forestry Association, and reads as follows:

Who Owns the Forests of Ontario?

"The Government of the province holds the right to almost every piece of forest-covered land in Ontario. Of course, if the Government put a stone wall around its forests and said to the people 'Keep Out,' there would be no great pulp and paper and lumber mills, no work in the woods for your fathers and brothers. In fact, the country would have a very very difficult time to get a decent living. So the Government long ago rented to hundreds of companies the right to use the timber growing on the provincial lands. In that way, the mills can get a supply of logs and thousands of men obtain profitable employment."

What is The Government?

"Every four years the people of Ontario hold an election and send to the provincial legislature, 110 men who are pledged to manage the building of roads and public buildings, the development of the forests, mines, fisheries, water powers, etc., the collection of certain taxes, questions of education and other important matters. The Government acts as General Manager of the Forests and has a 'Forestry Branch' to help carry out what the Government thinks necessary. This 'Forestry Branch' is of great value to the people. It looks after large tracts of forest that might easily burn down if a patrol were not present, and it protects the lives of thousands of settlers and their property."

Who are the "Limit Holders?"

"They are men or companies renting or 'leasing' the forests from the Government. By no means have they occupied all the forests in Ontario; there are 70 million acres not rented to ten million acres rented. The moment the limit holders start cutting down the timber they pay a price called 'timber dues' for every thousand feet of wood they take. In this way, the Government makes sure that the people of the province shall get a fair share of the money coming out of the public properties. The money that the Government obtains goes to build the roads and put up new buildings, help educate the children and do many other useful things, as well as guard the timberlands from fire."

"The limit holder, however, does not only pay the 'timber dues.' He pays in addition an annual tax on each square mile for the employment of fire rangers and for fire fighting. Then in most instances he had to buy the 'limit' in the first place either from the Government or a private holder, so that a large sum of money is actually invested in every 'limit.' Timber is not 'given

away' as some people carelessly remark. It is bought in the open market and the price creeps higher every year."

Which is best, a Forest or a Farm?

"Let us ask you, in turn, a question: Which is the most important leg of a three-legged stool?

"Dame Nature is a very wise provider. When she made the Province of Ontario she decided there should be plenty of farm land, plenty of lakes and rivers, plenty of beautiful valleys and plenty of forests. Dame Nature understood these things far better than we do. She first made eight or ten acres of stoney, sandy, gravelly soil on which trees alone could grow. Farm crops would perish on such land. Then she made to or three acres close by for farm crops." "I hope," said she when the job was finished, "I hope that no farmer will ever try to place his farm on the timber-soil for I want that soil to grow big trees to make big lumber and pulp mills, and at the same time I want the farmer to use every acre that will grow wheat and oats and barley and potatoes."

But how can I tell these lands apart?

"That is a good question, because there are no fences strung between them and any boy or girl might easily choose in error. Some of the good farm land has trees growing on it at present, and much of the timberland (set aside by Dame Nature so carefully) has been stripped of trees and now lies bare and useless. The only way to make sure is to consult the Provincial Government's experts, the Agriculturists and the Foresters. The trouble is that thousands of families have already 'located' on land that was made for growing timber and will never produce good crops of anything but timber. This is a great misfortune because Ontario has millions of splendid acres ready for the farmer—acres that will make plenty of money for their owners."

How big were the Forests in my great grandfather's day?

"That might easily be 120 years ago. A long time for a human

being, but a mere day's journey in the life of a forest. Forests were made to last forever. Trees are born and grow big and die, but their children keep the family going forever. At least that is what Dame Nature intended. Many European nations keep repeating and repeating their splendid forests for hundreds of years. They are never allowed to burn down or to grow poorer. Every citizen takes pride in keeping them strong and vigorous and the tree cutting is carried on with utmost care.

"In great-grandfather's day, the forests of Ontario were very much greater than at present. Forest fires have stripped millions of acres and only in recent years have we grown more careful of the precious timber. Of course, in the old days people thought the forests were so vast as to be proof against destruction. How absurd that was! Then, too, 120 years ago, a tree was not worth so very much. They used to burn in their fireplaces walnut logs that are worth \$500 each. No wonder that a forest fire was counted a trifling thing."

How big are the Forests today?

"You do not want a string of figures do you? Suppose we put it this way: 'The forests of Ontario are great enough to make the people prosperous and happy, but not great enough to survive any more destruction by fire.' Does that make it plain? Ontario does not own a single acre of timberlands that can be spared to the Fiend of Fire."

What is a Fire Ranger?

"He is a public servant. His duty, unlike that of a policeman, is not to arrest people. He seeks to prevent fires rather than to act as a *fire fighter*. He knows how simple it is to stop a fire from starting and how difficult and dangerous to meet a raging line of flames and prevent it from spreading. While the fire ranger must carry out what the law requires, he wants to *help* everyone, not to hinder. That is why he is

regarded as 'the friend of the settler' everywhere."

"The business of the fire ranger is to warn all persons of the dangers of carelessness with fire, to patrol a route laid out for him by the fire inspector, to post notices and distribute literature, to win the goodwill of all good citizens in the interests of forest protection, to supervise the dangerous work of clearing land by fire for which he issues a signed permit. He has many other duties, including the organizing of bands of fire fighters, but the chief part of his job is to prevent fires from ever starting."

Can I be a Fire Ranger?

"When you grow a little bigger, perhaps you can. But for the present you can be a 'Deputy Fire Ranger,' which is almost as important. Every boy and girl can sign the pledge at the back of this booklet which will help you to remember your duty every time you see any danger of a fire starting."

Do the Fire Rangers protect People as well as Trees?

"A good question, indeed! Sometimes we think of fire rangers as helping the forests only, but they save human lives and valuable property as well. If the fire rangers were dismissed tomorrow nothing could save the province from the terrible disasters that formerly swept across the settlements of Eastern Canada."

Tell me what causes Forest Fires?

"*People.* Natural accidents, like lightning, play a very small part in an average year. Here are some of the people responsible for the trouble:

"The settler who clears his land without a burning permit and chooses a hot or windy day and does not properly pile his debris."

"The railroad engineer who runs without a protected smoke stack and perfect ashpan and who dumps his ashpan on the ties without extinguishing the live coals."

"The track-repair gang that thinks nothing of leaving a camp fire burn-

ing or tossing a lighted cigarette into the dry grass."

"The camper who neglects to extinguish his camp fire thoroughly with a few spades of earth or a few buckets of water."

"The berry picker who is willing to imperil his neighbor's life and property by carelessness in smoking or camp-fires."

Do Forest Fires cause much Harm?

"Forest fires seldom do anything except HARM. One may as well ask: 'What good is smallpox?' Smallpox and forest fires are twins. They represent misery and poverty and often death. We all are trying to drive disease out of the country. Forest fires ought to be dismissed too. We cannot afford them any longer."

"You have seen your daddy or your uncle go to work in the woods or in a lumber or paper mill, perhaps. One day there may come a great forest fire, caused by some careless person. Most of the timber within reach of the mill may be destroyed. What happens? The big mill may be forced to close its doors because the timber has been uselessly burned. The owner tells his workmen: 'A forest fire has ruined us all. We cannot continue a single day without the forest.' Disappointed families pack their belongings and move to other parts of Canada. The new school and church buildings are left uncompleted and houses and stores are deserted. These sad results have followed forest fires in all parts of the Dominion."

Will not Farms come when the Forests go?

"Please turn back the pages to the little heading, 'Which is best, a Forest or a Farm?' There, we explained that nearly all the land in Ontario now growing forests will *not* grow farms. Two-thirds of Canada is no good for farms but will grow splendid trees. Let us make the point very clear."

"The spruce and balsam and pine trees maintaining hundreds of Ontario mills grow, as a rule, where wheat

and oats and potatoes would perish. How sensible it is, therefore, to put on each kind of land exactly the growth that will bring the owner most money. Of course, trees will grow quicker and better on rich clay loam, but such soil rightly belongs to the farmer and should be cleared. Good soil is not nearly as important in forestry as in agriculture. The forest is a natural improver of soil, for each year the decaying needles, leaves, twigs and branches add to the richness of the ground, while wheat and oats and barley take away from the soil without adding much to it. Here is another feature. The 'sub-soil'—underneath the surface layer—is not important in farming but it is most important in growing forests because the trees sink their roots very deep and draw up for their nourishment the moisture lying far beneath the surface. Land too dry on the top layer for field crops will often grow splendid trees."

How do the timberlands make Ontario prosperous?

"Suppose we were to draw a picture of two long roads. One road leads from the forest to the paper mill. Down it we see a great procession of spruce and balsam logs, bound for the huge 'grinders.' It is hard to guess how many logs there are, but one Canadian mill takes out of the forest a million trees a year. Then we see the other road, leading from the mill to the great cities of Canada and the United States. No longer do we find a procession of logs, but of mammoth rolls of paper, ready for the printing presses. Do you know that in the United States and Canada every week-day forty million newspapers are whirled from the printing presses and that 6,000 tons of raw paper are necessary to keep those presses in operation?"

"But there is something else in the picture. While the logs almost fill up one road and the manufactured paper fills up another, we see a more wonderful line of wagons returning from the cities and towns where the paper cargoes have gone. What are these return wagons carrying? It

looks like an endless band of glinting gold. Indeed that is exactly what it proves to be, for these wagons are bringing back into Canada from Uncle Sam's great country to the south 40 millions of dollars just for a twelvemonth's supply of paper. All along the roads, men in charge of the wagons hand out small bags of the rich metal to every man who had anything to do with making the paper or cutting or driving the logs. Thousands of men claim and receive their share until when the wagons at last reach the camps in the forest most of the money has been distributed."

"This gold seems to come from the cities, doesn't it? Actually, however, it comes from the forest. The moment the forest is ruined, the procession comes to a stop. Logs no longer go to the mill, paper no longer goes to the cities and the wagons of gold no longer start on their welcome journey into the towns and villages and farming communities of our Province."

"The little picture we have called to your imagination applies in the same way to the lumber mills.

"So now we have come to the end of our little catechism on the Forests. No there is something else—the Pledge. Every boy and girl who wants to strike a good blow for Canada will see that their names are entered in the back of this booklet."

CANADA CLAIMS SHIP RECORD

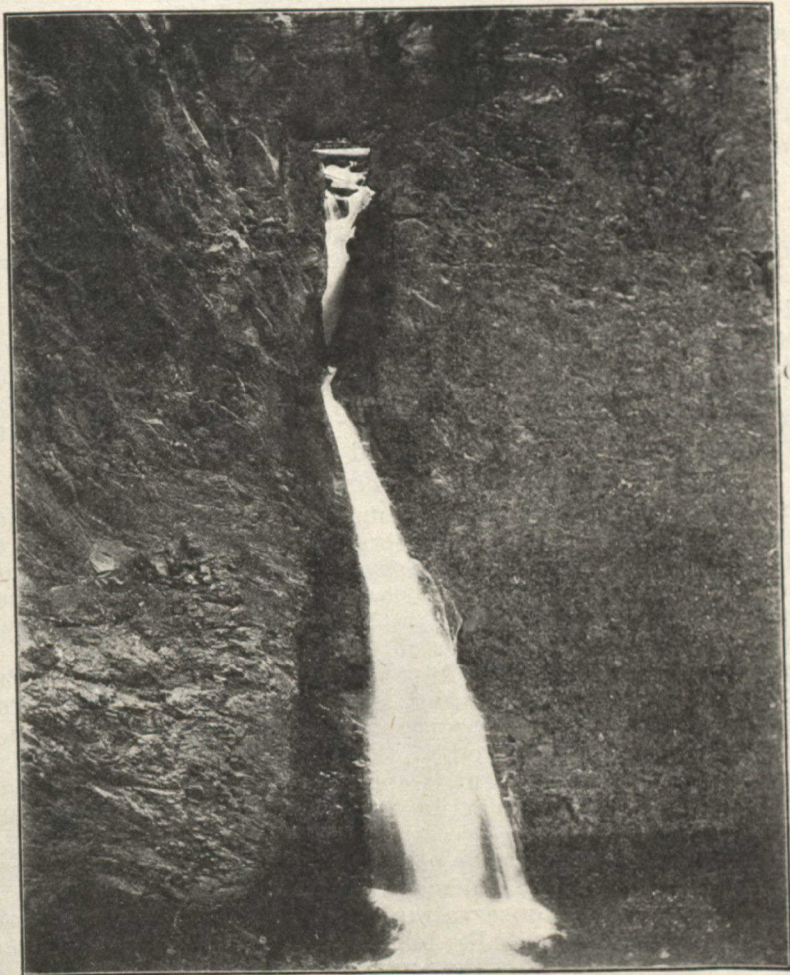
Canada now claims the record for wooden ship building on the American continent. The feat was accomplished by Quinlan & Robertson Ship-building Co. of Quebec, in the construction of the *War Seneca*, a wooden steamer. This vessel was launched on June 13 and a dock steam trial was made forty-eight days later by turning over the main engine and auxiliaries under steam. This is six days better than the previous best made in the United States, which is said to have been fifty-four days. The ship was built for the Imperial Munitions Board.

OVERSEAS SAWMILL RECORDS.

The U. S. Forest Engineering Corps in France have been making some remarkable sawing records with the little 10,000 capacity mills that were their first equipment. Working double 9-hour shifts they have turned out products running from 540,000 to 700,000 feet monthly. The 20,000 feet capacity mills were slow in arriving and arrived in large instalments, the boilers usually coming over last. At last reports, however, seven

of the larger mills and ten of the smaller or 10,000-foot capacity mills were in operation and eight more of each size were being installed. One of the 20,000 foot capacity mill cut 1,923,242 feet of lumber, mostly thin lumber, in April, assisted by a little French portable rig and also by a bolter mill.

The product includes lumber for every military use and even excelsior for the bedding of soldiers, two excelsior mills having been added to the equipment.



TAKKAKAW FALLS, B. C.

A Forward Move in Nova Scotia!

Forest areas now working at half capacity—Potential value of N. S. Woodlands 300 millions.

That Nova Scotia will be the next province to hitch its forest resources to enlightened management appears now to be something more than a distant expectation. By no means has the Nova Scotia Government failed to appreciate the importance of a progressive forest policy. In 1909 and 1910 a forest survey, undertaken by Dr. Fernow, Dr. Howe and Mr. J. H. White rendered results of great value from the stock-taking point of view. The Nova Scotia Legislature also passed an Act providing for the appointment of a Provincial Forester and upon that legislative move great hopes were based at the time.

Most of Forests in Private Ownership

Onlookers have sometimes failed to make allowance for the unique position in which Nova Scotia's Government is placed in relation to control of forestry affairs. By far the larger part of the wooded area, (about eighty per cent.), is owned by private persons and companies. Not only are the revenues from Crown Forests relatively slight, but the authority of the Government in imposing conservation requirements on timberlands is limited to the least valuable and accessible areas, located chiefly in Cape Breton.

When all considerations are matched, however, the strong conviction persists that one of the chief functions of government is to protect and perpetuate the forest resources. This is not a matter alone of exercising police power. In fact, the situation in Nova Scotia calls not for a dosage of Law but for a mutually-agreeable form of co-operation between government and private owners.

Indeed, every phase of the present forestry situation in Nova Scotia—fire prevention, administration of the ranger system, examination of Crown lands, study of private woodlands with a view to their more profitable operation—suggests the appointment of a Provincial Forester, not five years from now but NOW. Measured in terms of public welfare, the proper sort of Forester could earn his salary a thousand times over.

A Campaign of Education Started

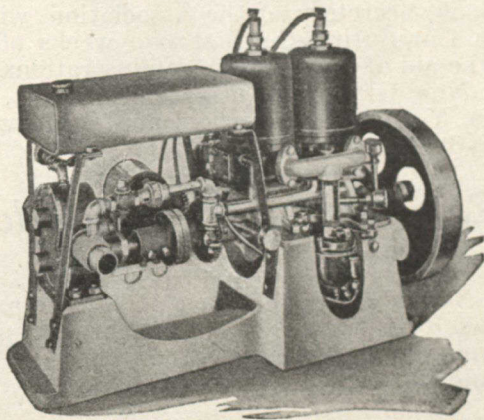
The Canadian Forestry Association, during the past month (and continuing through the months of October and November) has been directing a campaign of popular education in Nova Scotia so as to apprise thousands of citizens of the imperative need of a forward movement in forest conservation. The purpose is to create a sufficient public opinion to justify any government in proceeding along the lines suggested.

There would seem little doubt that the appointment of a Provincial Forester would attract general support. One of the largest lumber firms in the province wrote the Forestry Association in this vein: "Your plan, as outlined, is exactly what is required in this Province. It would not only be popular so far as the government is concerned but would be a long step in advance in regard to the protection and increase of our remaining forest area."

The Lumbermen's Association of Western Nova Scotia have pressed for a Provincial Forester and fully realize the gravity of further delay.

The Commission of Conservation have not only urged similar action upon the Government repeatedly but have done an invaluable service in publishing and circulating Dr. Fernow's study of Nova Scotia forest conditions.

The following excerpts from Dr. Fernow's book are of interest to every



FAIRBANKS-MORSE FIRE FIGHTING ENGINES

These compact powerful little pumping outfits have repeatedly substantiated our claims during the past year, all over Canada.

They can be readily transported wherever man or pack horse can go.

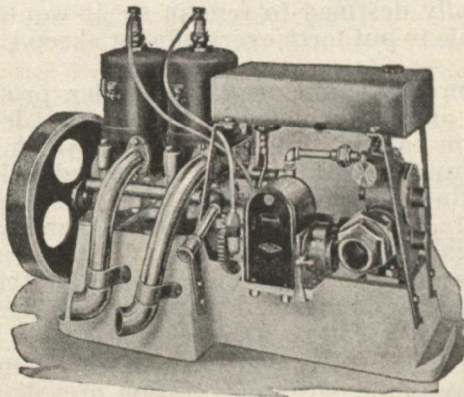
Governments and Private Owners of Forests everywhere, can materially reduce their fire losses by the use of these outfits.

Full information and prices on request.

THE CANADIAN FAIRBANKS-MORSE CO., Limited

MONTREAL - OTTAWA

ST. JOHN, QUEBEC, TORONTO, HAMILTON, WINDSOR,
WINNIPEG, SASKATOON, CALGARY, VANCOUVER, VICTORIA.



reader of the Forestry Journal. They have been made into a brochure which has been given wide distribution in Nova Scotia during September in connection with the Association's educational campaign.

Twelve Public Meetings

Mr. Robson Black, Secretary of the Association, will be in Nova Scotia with the Exhibition Car during the first two weeks of October, delivering daily lectures with the aid of motion picture illustrations. Visits will be paid to Amherst, Truro, New Glasgow, Antigonish, Halifax, Windsor, Wolfville, Kentville, Annapolis, Yarmouth, Liverpool and Bridgewater. Special meetings of Boards of Trade and other public bodies will also be held.

Dr. Fernow's Recommendations

(Excerpts from "Forest Conditions in Nova Scotia.")

Can Nova Scotia's Forests be Made 'Fireproof'?

"There is no reason why in a few years of earnest and determined effort, by an educational campaign and by efficient protective service, the destruction of forest by fire should not be reduced to a rare accident."

What First Steps are Necessary?

"As an expression of its educational function, the Government should establish a Provincial Forester, whose business it should be to study the situation in the various localities and act as public adviser and instructor."

"The appointment of a Provincial Forester—as has been proved in several States of the Union where they have such officials—would immediately result in an awakened interest in the possibilities of improved methods of forest use and from what we have seen and heard during the progress of this survey, the woodland owners will be found ready to follow his advice."

The Forester's Handling of Crown Lands

"With such a Provincial Forester, the government would also be enabled to find out what is the best policy to pursue with regard to the remaining Crown lands. Their extent, exact location and condition should, of course, first be ascertained, and in their management, considerations of their future, rather than their present, value should dictate the policy. If the Government cannot manage its property conservatively, who will?"

Nova Scotia Forests Working at Half Capacity

"Finding that 80 per cent. of the Province—when not barren—is forest country and practically destined to remain so, it would appear rational for government and people to put forth every effort to keep the same in productive condition."

"Here is a natural resource, 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; a resource which, basing its value on reasonable rates of growth, both of wood and wood values, may reasonably be stated as representing a potential capital of at least \$300,000,000.

"It is now largely in poor condition and is being annually further deteriorated by abuse and injudicious use."

"To arrest further deterioration and to begin restoration is the present duty of those who have the continued prosperity of the Province at heart."

The Call for Immediate Action

"In no portion of this Continent, and of the Dominion in particular, are the chances for the immediate inauguration of a definite forest policy so favourable as in Nova Scotia, and this is so because of the presence of an intelligent, well-distributed population."

The brochure closes with the query:

"Is a \$300,000,000 property worth insuring? Are the Forests of Nova Scotia worthy of organized fire protection?"



On the way to the Upper Hot Springs, Rocky Mountains Park

“My Personal Stake in Forest Protection”

(From a Canadian Forestry Association Folder Distributed from the C. F. A. Exhibition Car throughout the New Brunswick run.)

The object of this Exhibition Car in New Brunswick is to convince you of the need for your personal co-operation in the important business of forest protection. You are aware that a new Forest Service has been organized, with a competent Chief Forester and an adequate staff. This staff is appointed by a non-political Forestry Board where all applicants are disposed of according to personal merits and that alone. The districts where forest fire hazards exist will be adequately patrolled by men who must make good or forfeit their jobs. Such modern equipment for fire protection as lookout towers, gasoline pumps, motor vehicles, canoes, etc., are being liberally provided from the public treasury. Every citizen of New Brunswick has reason to regard the Forest Service as one

of the most progressive and economical steps ever undertaken by any government. It forms, so to speak, an insurance policy upon the greatest money-making enterprise we have—the productive Forest—protecting it against the fire-ruin and careless cutting which ultimately would have left New Brunswick in a deforested and impecunious position.

70 PER CENT USELESS FOR FARMS

New Brunswick depends more upon its forest wealth than any other Canadian province except British Columbia. As much as 70 per cent. of the total area is non-agricultural in character of soil but, at the same time, of great value for the production of trees. Obviously the business of the Forest Service is to keep

that seventy per cent. producing timber of the most valuable species and producing not for a few years but for generations to come.

The first and mightiest enemy of the Productive Forest is Fire. The Forest Service does not pretend that even the best organizations, the highest lookout towers, the most modern machinery are invariably capable of combating forest fires. The patrolman's first duty is to enlist the good will and concern of all in his neighborhood towards the prevention of fires. The moment we think of forest protection as **community business**, that moment the ranger's **efficiency** multiplies a thousand per cent. It is the **community, the merchant, farmer, fisherman, mill employee, railroadmen**, who pay the bill for forest fires, not the "Government" or the "lumberman" who are merely temporary administrators or agents in utilizing the forest resources. Where dozens of New Brunswick towns rest their foundations upon lumber mills and pulp mills, it is plain that the destruction of forests directly involves the destruction of those towns. Where thousands of New Brunswick workmen look for their pay envelopes to a lumber company, is it unreasonable to expect that each workman will protect the timber that protects his job? Since numerous families of settlers must pay the tragic toll of sweeping forest fires (Ontario lost 223 people in the 1916 holocaust) has not the ranger a right to expect the settler to take every precaution in burning his land or otherwise in the use of fire? No one has yet invented a way to cut the cord between forest fires and grave yards.

A FOREST DESTROYER.

The camper! the fisherman! What right has either man to destroy in a few hours by a tossed-away cigarette or match or unextinguished camp fire the woods to which he owes his day's sport? And yet, three of the worst fires in New Brunswick this year were the work of campers who defied the rights of their fellow men and played false

to all decent standards of citizenship. Forest fires kill the lumber mills and the lumber towns.

Forest fires cut down New Brunswick's big earnings from visiting hunters and fishermen.

Forest fires postpone any income from a timber area for seventy-five years, and often for all time.

Forest fires steal from the provincial revenues of half-a-million dollars supplied annually by operations in the forest.

Forest fires imperil the lives of thousands of settlers.

Forest fires rob all railways in New Brunswick of a chief commodity in freight traffic.

This is all on the debit side of forest fires. Can you think of anything on the credit side?

ARE YOU INCLUDED HERE?

Camper! Fisherman! Hunter! Do you build your camp fire on rocks, gravel or earth where it is safe? Do you build the fire small so that it cooks best? When you are through with your cooking, do you souse the

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CANADIAN FORESTRY JOURNAL

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embers with two or three pans of water, or cover them with earth? The real sportsman always does these things.

Settler! Do you pile your clearing slash away from standing timber? Do you pile it in windrows? Do you choose a burning time when the wind is down and conditions are safe? Do you make certain to obtain a written permit from your fire ranger as the law now requires?

Railroad Engineer! Is the ashpan of your locomotive dropping live coals? Is the smokestack protected as the law specifies?

Smoker! Is your cigarette worth a million dollars? Does your burning match look as good to you as the jobs of two hundred working men? Yet you and your cigarette, your match, the heel of your pipe—small as they may seem—are the timing-gear to big disasters. It is up to you to keep the strictest guard on them. Put out your cigarette—Dead Out! Put out your lighted tobacco, Dead as you can make it!

WOODEN OVERCOATS NEXT

The paper clothing that to some extent has been used for German soldiers has been spoken of somewhat contemptuously and undoubtedly much of it has been a very poor substitute for the usual textiles and adopted only because of scarcity of better material. Textile paper spinning processes are, however, still being improved and the announcement comes from Sweden that a new process of manufacture bids fair to revolutionize the whole clothing industry.

Much stranger things have been accomplished in the past than the utilization of wood cellulose to provide textiles which at will may be made to reproduce the qualities of silk, cotton or wool. The difference between these textiles is more in the form of the fibre than in substance or chemical construction.

Canadians Beat All Comers in Aerodrome Work

In recent months the Canadian Forestry Corps has greatly extended its co-operation in behalf of the Imperial, French and American forces. Practical appreciation of this assistance has been expressed in several letters received from the higher command of the allied forces. In a letter to Sir Edward Kemp, Canadian overseas minister, the Right Hon. Lord Weir, secretary of state for the Royal Air Force, asks for further assistance from the Canadian Forestry Corps in the construction of aerodromes in France and England for the R.A.F. He states, in his letter, that the men of the Canadian Forestry Corps are so well fitted and equipped for this class of work that a great economy in labor is effected by their employment. One company of them, it has been estimated (approx-

imately 170 strong, is equivalent to at least 600 of the ordinary labor obtainable in England.

Sir John Hunter, administrator of works and buildings for the Royal Air Force, has written along similar lines to the officer commanding the Canadian Forestry Corps. Testimony to the value of the work being done has also been received from the French army commanders, and also from the Comite Interallie des Bois de Guerre.

\$1,000,000 TO FIGHT FIRES

Washington, D. C.—A loan of \$1,000,000 has been made to the Forest Service from the President's special defense fund to combat fires in the national forests of Northwestern and Pacific Coast states.

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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B. C SHIPS CARRY B. C. WOOD

A report of lumber shipments from B. C. during the year, states that every vessel of the fleet, built during war time on the Pacific Coast, which has as yet made her maiden voyage was utilized for carrying B. C. timber. The vessels and the destination of their lumber cargoes was as follows: Mabel Brown for Sydney, Margaret Haney for Bombay, Geraldine Wolvin for Sydney, Laura Whalen for Adelaide, Jessie Norcross for Adelaide, Malahat for Sydney, Esquimalt for Melbourne, Janet Caruthers for Adelaide, Marie Barnard for Sydney, and the Mabel Stewart for Adelaide. The other two vessels of the schooner fleet, the Jean Stedman and the Beatrice Castle, have not as yet made their maiden trips, but the former will take a cargo of lumber to Australia on her first run.

Very appropriate indeed is it that these vessels, made of B. C. timbers, and in B. C. yards, should, on their maiden voyages, be utilized for the purpose of carrying products of B. C.

forests to various quarters of the globe, remarks the Pacific Coast lumberman.

THE AIRPLANE SPRUCE HUNT PRINCE RUPERT.

—This port has been transformed into a lumber depot following the pressing demand for aeroplane spruce. Every steamer that arrives brings its quota of men interested in that branch of industry and about the hotel corridors one hears in most of the conversation references to timber limits, clear spruce, tows and tug boats, mixed in where formerly the language employed most frequently carried the suggestion of fishing, and fish curing. From all along the coast there are gathering those who are identified with the timber cruising and logging business. The Queen Charlotte Islands is the destination of most of those arriving, but there are camps being established elsewhere along the northern coast, and the season promises to be one of the greatest activity.

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Huge Losses from Logs Sinking

During the progress of the Canadian Newsprint inquiry at Ottawa recently, much information of interest to lumbermen was given by expert witnesses in regard to loss through sinkage on river drives. A record for two years produced by Mr. D. J. Salls, of the Howard Smith Company, for drives on the Chaudiere River route, showed 25,690 cords put into the water and 22,948 taken out, a loss of 2,742 cords. On the Etchemin River 11,777 cords were put in and 10,266 cords taken out, a loss of 910 cords, or 8.2 per cent. Mr. Salls said that sinkage was always a little higher than ten per cent. and sometimes reached 12 per cent. This applied to four-foot pulpwood spruce and balsam.

John R. Booth estimated his sinkage loss at fifteen per cent. He has allowed this percentage for sinkage for the last forty-five years. The

drive averages 300 miles and takes from two to three years to reach the mill. Mr. H. I. Thomas, also of John R. Booth, testified that if small logs were driven the sinkage would amount to twenty-five per cent.

Mr. Charles Dougherty, secretary of the Rideau Lumber Company, Ottawa, showed statements indicating losses from 22.53 to 24.79 per cent. The lower figure applied to spruce logs only. The drive took two years and was about 150 miles. The figures were obtained by taking the difference between the number of logs put into the water and those which reached the mill.

Mr. S. A. Sabbaton, assistant manager of the Laurentide Company, produced a statement covering the years back to 1906. The average yearly loss was nine and two-tenths per cent.

Mr. Alexander MacLaurin, of the

50^{CTS.}

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YALE University Forest School is a graduate department of Yale University. It is the oldest existing forest school in the United States and exceeds any other in the number of its alumni. A general two-year course leading to the degree of Master of Forestry is offered to graduates of universities, colleges and scientific institutions of high standing, and, under exceptional conditions, to men who have had three years of collegiate training including certain prescribed subjects. Men who are not candidates for the degree may enter the school as special students, for work in any of the subjects offered in the regular course, by submitting evidence that will warrant their taking the work to their own advantage and that of the School. Those who have completed a general course in forestry are admitted for research and advanced work in Dendrology, Silviculture, Forest Management, Forest Technology and Lumbering. The regular two-year course begins the first week in July at the School camp, Milford, Pennsylvania

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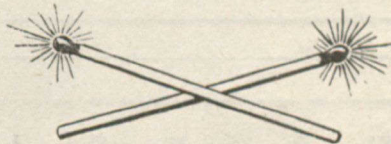
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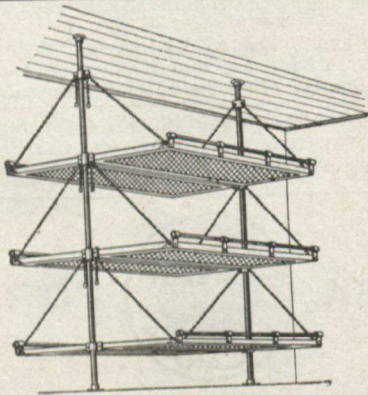
St. Maurice Pulp and Paper Company, gave evidence regarding lumbering on the North River, where sinkage, covering a period of three years amounted to 18.9 per cent. Included in the figures given were 328 cords which were taken from the bottom of the river by a scow. Nine per cent. was written off for sinkage on spruce and from thirty to forty per cent. on balsam. The loss on sawlogs was given at nine per cent. and on four-foot pulp logs sixteen per cent.

An interesting sidelight on the scarcity of woods labor which is hindering lumbering operations this year was shown when counsel announced that one company had paid thirty thousand dollars to employment agencies alone to get men to go into the woods.

N. B. PROSECUTES SETTLERS.

Fredericton. Sept. 5.—A resident of Nashwaak will appear before the Magistrate at Fredericton, N.B., on September 17th to answer to a charge of having set a fire without the necessary fire permit on the 26th of August. As it was a dry windy day, this fire would have done very serious damage to the surrounding forest if twenty-five men had not gathered quickly to extinguish it.

A similar case will be heard in Anderson, Restigouche Co. on the same date, against a settler who, after being personally warned, set fire to his slash without a permit on another dry windy day, and this fire was not extinguished until after five hundred dollars damage was done.



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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.

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