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CONTENTS FOR MAY

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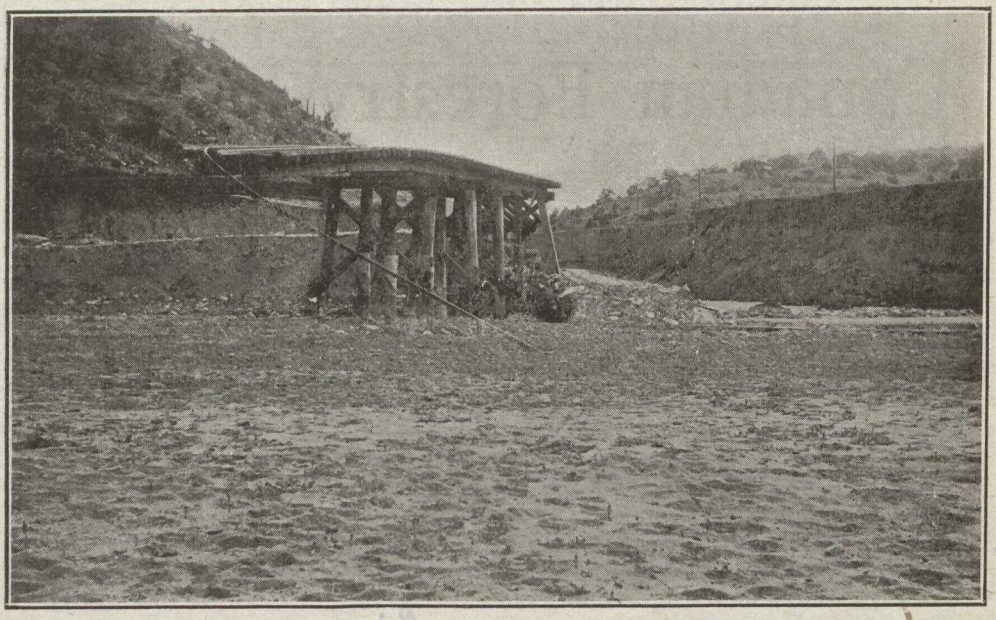
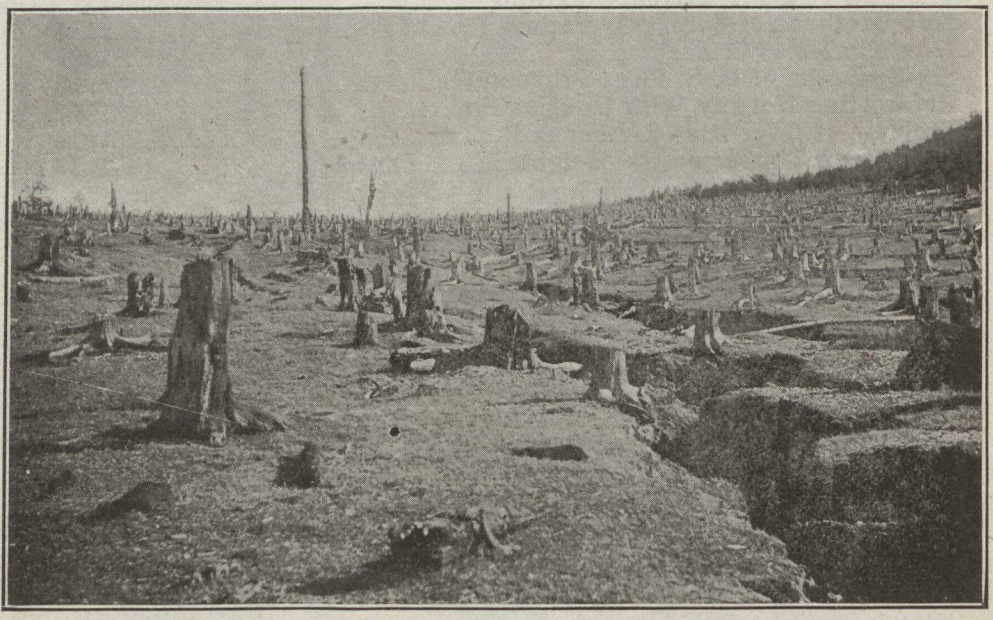


DIVIDENDS FROM DESTRUCTION OF WATERSHED FORESTS :
A Colorado railroad trestle left standing in midstream after washout in spring of 1914.



AN AREA CLEAR CUT YEARS AGO FOR CHARCOAL AND LATER BURNED.
Note the high stumps, lack of reproduction and erosion in right foreground.
Photos by courtesy U. S. Forest Service.

Scientific Investigation and the Forest

While Other Nations Forge Ahead in Research Work in Living Forests Canada Pays Small Heed

The forests of Canada are one of its leading natural resources and like forests everywhere are, as living bodies, subject to laws of development that can be ascertained by careful study. The growth and production of the forest are affected by conditions of soil, moisture, air and light, by the relations between species and their adaptability to differing conditions, by destructive agencies such as fire, insects, fungi, etc. While the forests are subject to and often succumb to destructive agencies, on the other hand they are capable of reproduction and development. They may be perpetuated for all future time and their production and value can be increased by proper management. The conditions of forest growth are therefore a subject for thorough scientific study.

Principles of Management

Every country which has come to the point where it felt the need of managing its forests for better production has seen almost immediately as a necessary consequence that special provision must be made for scientific study of the forest to determine the principles of management that must be followed. Russia, Sweden, Germany, Austria, France, Switzerland, British India, the United States of America, have all organized specially for such investigations.

Russia presents perhaps the nearest comparison to Canada in extent, climatic conditions, forest area, etc., but in the general conception of the public is not considered as a progressive country. Russia has however for many years had established a system and organization for the scientific study of its forests and the reports published by the institutions established for this purpose are among the most suggestive and valuable of any reports issued by the forest service of any country. The central organization for forest investigation is the Imperial Forest Institute at Petrograd which was founded 110 years ago at the same time that the Russian Department of Forestry was established. This institute, like most European institutions of higher learning, is a school for training foresters as well as carrying on research work. In 1915 there were employed fifty-four professors and instructors and the number of students was 648. The institute comprises twenty-three buildings, thirteen laboratories and museums and a splendidly equipped dendrological garden. The appropriation for the year was $119,000. The results of investigations made at the Institute are published in its transactions which have now reached to twenty-five volumes in number. These include various papers on the effect of climate on forests and forest reproduction, the forest types in Russia, the technical qualities of the woods, etc. Forest investigations are carried on at other forest schools, especially at Novo-Alexandrovsk, near Warsaw, and at the Riga Polytechnicum.

Twelve Experiment Stations

There are also twelve Forest Experiment Stations in Russia, the total annual appropriation for which is about $60,000, where special field investigations in the planting and propagating of the forests is carried on. The results are published irregularly as material accumulates.

At the central office of the Forest Department at Petrograd there is a special committee on Experimental Research Work, the chairman of which is directly responsible to the Director of the Forest Department. Every year, usually in February, there is a meeting of the Central Committee for investigative work held in Petrograd which is attended by all the Superintendents and assistants from the experimental stations. To the se

meetings are also invited professors of forest schools and specialists in allied lines of research such as plant physiology, ecology and meteorology. At this meeting the work of the past year and plans for the next year are discussed, the studies to be carried on for the next year are decided upon and allotments of funds are made for each project.

United States' Attitude

The United States has an area about equal to Canada and forests of somewhat greater extent and value. That country however had not proceeded far in organizing for the proper management of the forests before it found that there was not sufficient knowledge of the principles that underlay the development of the forest or the influences that affected it. Provision has therefore been made on a fairly large scale for the study of the forest by the establishment of nine Forest Experiment Stations, the maintenance of which requires an expenditure of $215,000 per annum. This is in addition to the Forest Products Laboratory at Madison, which deals with the wood after production and removal from the forest, the appropriation for which is $180,000 per annum.

The following from the Review of Forest Investigations by the Forest Service of the United States, is quoted:—

"The experimental work as now conducted at the Forest experiment stations is by far the most important. For the last few years it has been felt that only by well-ordered experiments can empirical procedure be replaced by truly scientific procedure.

How U. S. Scheme Works

"Advantages of economy and greater efficiency in conducting investigative work in silviculture at an experiment station are apparent. Under the old system of conducting investigative work, assignments to an extensive area were usually necessary, to which the observer could devote but a short field season. Under the system of Forest experiment stations, specially trained men are permanently assigned to a given region with which they have an opportunity to become thoroughly familiar and therefore are capable of conducting the work with the greatest effectiveness and least expense. Each of the experiment stations is allotted an area sufficient for the proper handling of short-period experiments, for experiments requiring a number of years, and for the maintenance of large permanent sample areas which serve as models typical of the silvicultural region. Such areas furnish the most valuable, instructive, and convincing object lessons for the public in general, for professional foresters, lumbermen, and owners of forest land, and especially for the technical and administrative officers of the National Forests.

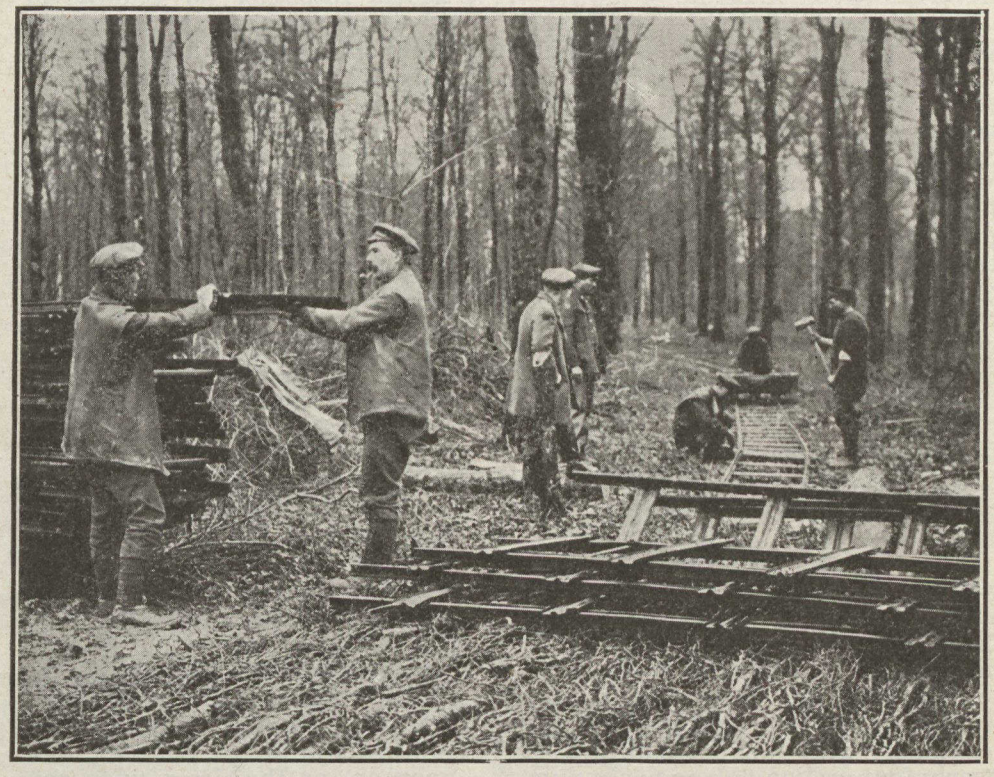
"The organization of the Forest experiment stations made possible the use of uniform methods in dealing with forest problems. General problems are treated at the different stations simultaneously; local problems in the region to which their results apply. All of the modifying factors which enter into the results of experiments are measured by observations covering many conditions and years and are thus determined once for all with the greatest economy and the least duplication of work.

"The stations are distributed in such a way that one station is located in each of the silvicultural regions of the West. A single Forest, representing as much as possible the conditions typical of the region, is selected and a portion of this area set aside for the purposes of the experiment station."

Export Trade in Timber

In Canada the forest resources of the country have been one of the great wealth producing factors. Production is urged on the country as a national duty and particularly production for export so that Canada may in this way meet the great debt which the war requires her to undertake when the production of the forest is looked at from this point of view. The figures of the total production from the forests have not been obtained in a sufficiently accurate way to give a reliable statement for any lengthened period. For

Getting Logs to the Mill at the "Front"



(British Official Photograph)

LAYING A LIGHT RAILWAY ON WHICH LOGS WILL BE BROUGHT TO A NEW SAW MILL IN NORTHERN FRANCE

the last few years from 1912 to 1915 the production from the forest has been from $172,000,000 to $177,000,000.

Accurate figures are however available as to the value of exports from Canada and the total for the years 1868 to 1914, that is, from Confederation to the present time, show that the contribution of the forest toward the payment of the public debts owed outside of Canada has been very large.

Value of Canadian Exports from 1868 to 1913.

Agricultural Products	$1,625,890,767
Animals and their Produce	1,566,701,217
Forest Products	1,322,646,431
Mineral Products	731,514,593
Manufactured Products	571,049,221
Fisheries Products	443,233,427

It will be seen that the forest is second only to the farm in the supply of goods for export. It is considerably larger than the export of the mines or fisheries. A considerable proportion of the manufactured products is also to be credited to the forest.

Public Revenues from Forests

Further, the forest has been considered and used as a source of direct public revenue in Canada. So as to accomplish this more fully the title to timber lands has been kept in the Crown and the state has not only received a purchase price for the timber but a rental for the ground and royalty on the timber taken out. The annual revenue of the different governments in Canada which own

timber lands amounts to seven million dollars. The production of the forest is therefore one form of production which is worth giving consideration to and assisting in the interest of the development of Canada.

The quantity and value of the products from the forests depends much more on proper management based on scientific principles than the public generally are aware. As an example, Saxony, between 1817 and 1893, increased its output per acre from the forest lands of the kingdom by fifty per cent., increased the proportion of timber from seventeen to seventy-nine per cent., increased the gross revenue from $1.75 to $6.67, and the net revenue from 95 cents to $4.37.

Investigation Work in Canada

In Canada the State has recognized the necessity for scientific investigations of the natural resources of the country in the field and in the laboratory.

The Department of Agriculture was established for the purpose of scientific research in matters relating to agriculture and the many divisions into which such work inevitably develops have now grown into a large well-equipped and progressive department with an expenditure of nearly four million dollars per annum. It should be noted that the Department of Agriculture is almost wholly an investigative department, not an administrative one. It does not administer the agricultural lands of the country. The agricultural lands it does administer are the experimental farms where experimentation is the main purpose.

The Department of Mines similarly was organized to make investigations in connection with the mineral resources of the country. No more than the Department of Agriculture is it an administrative department. Its expenditure of about eight hundred thousand dollars per annum is devoted through the two divisions of the Geological Survey and the Mines Branch to investigation in the field and in the laboratory for the study and development of the mines of Canada. And it has a long and useful history of achievement behind it.

Where Policies Need Bracing

In connection with the forest wealth of the country, a resource which bad management or neglect can destroy so easily and which responds so readily to wise management by increase in production, there has been no special provision for scientific investigation until the recent establishment of the Forest Products Laboratories of Canada in connection with the Forestry Branch of the Department of the Interior. But these laboratories only deal in research on the dead material and the expenditure for this purpose which is about $60,000 is small compared with either of the investigative departments mentioned. But further there is no special provision made for scientific research in the forest, such desultory research as is carried on being merely an incident to administrative work in the management of the forest lands of the country. There are no forest experiment stations in Canada. There is no broad, sound, scientific basis being laid for the management of the forests and the lack of it is being felt and will be felt more as time goes on, as the drain upon the forests continues to increase as it is doing steadily to-day, and as the present low average of production by growth in the forest consequent on forest fires and unscientific management is realized. The time is surely ripe for providing in some measure for formally beginning the scientific investigation of the forest and its life processes which are so essential and fundamental.

Some of the biggest forest fires began with a single wisp of flame. At the start, a child could stamp it out. At the climax not a battalion of forest rangers could stay its vicious sweep. Whole townships pass beneath the pall of smoke and smothering heat. Farms and villages are turned to shambles. Lives and untold property heap up the awful penalty.

Protection of Birds a Farm Asset

BY C. C. CLUTE

IN "OUR DUMB ANIMALS"

If one tenth of all the agricultural products raised annually in the United States were scattered over different sections of the country where most needed, would it help fight the high cost of living? Statistics show that annually there is a loss of between $800,000,000 and $900,000,000 in the agricultural products of the United States, all due to the ravages of insects.

This fact was cited recently by a leading Chicago paper, and it was further cited that the loss might be materially lessened were birds protected as they should be. When one of the leading metropolitan newspapers of the land advocates that every available plot of ground be turned into a garden spot and cultivated, and when in the same issue that same paper urges that birds be protected that they might destroy insects, it is surely time for every one to consider what part he is to do in the work, and, insofar as possible lend a hand in doing his mite. One insect destroyed in the spring means the destruction of hundreds, and in some cases thousands, ere the summer is over.

Government statistics and personal observations show over and over again that the birds are the farmers' best friends, which, in return for their services, ask only protection that they may bring forth more enemies of insects.

Just how is this protection to be given? Happily the time is passed, or nearly so, when the farmers think that the birds must be destroyed because of the fruit they eat. In comparison with the amount of good they do, the amount of fruit eaten by birds during the summer is an infinitesimal matter,—a mighty good form of insurance for the farmer.

But there is another way in which the birds require protection, and that is protection during their nesting season. Not only should prowling cats be restrained and egg collectors either be made to see the folly of their heartless whims or else be summoned before the law, but provision should be made for the nests. Birds like company. Even the bluejay, usually termed a rascal but at heart a boon companion of the farmer, likes to have his nest near a dwelling. The robin appreciates forked sticks placed in trees for him, and the wren, bluebird, and purple martin enjoy the companionship of man as soon as they learn that he is their friend.

The best way to get on amicable terms with birds is to build and put up bird-houses and see that such are not destroyed by boys or preyed upon by cats. Put up a single birdhouse this summer if you are a skeptic and watch the wren, or bluebird, or purple martin, as it feeds its young, taking note of the kind of feed it uses and the number of trips made per hour. Keep a record of this for a few hours, estimate the good done in a day, in a week, in a month, and in a nesting season, and you will be wiser the following year.

I know one farmer in particular who lost, during one summer, three rows of corn forty rods long. The corn grew next to a fence row heavily sodded with blue grass, which produced swarms of grasshoppers. For the sake of experiment alone, for this farmer was a skeptic, last spring he put up twenty-one bird-houses, placed two rods apart on the fence along the forty rods. The houses were some that he and the boys had made during the winter months, from dry-goods boxes obtained in town. Thirteen of the twenty-one houses were inhabited during the following summer, six by wrens, four by bluebirds, and three by colonies of purple martins.

The grasshoppers that summer

made a rich living for the birds, and when the fall came, that farmer had the satisfaction of gathering twenty-three bushels of corn from the three rows that grew next to the fence, right where there was no corn at all the year before. With corn selling at fifty-five cents per bushel, it represented a saving of $12.65 for that year alone, and with the same insurance for the following year with no outlay at all. Does it pay? Boys, get busy. Get your fathers to figure with you how much corn growing next to a fence row is destroyed by insects, and then see if your fathers will let you put up bird-houses and pay you the difference for the first year.

The Case for The Woodpecker!

"What good is the woodpecker?" Letters reach the Canadian Forestry Journal asking this question and in many cases proceeding to answer it with threats of extermination for all woodpeckers seen about the correspondent's property.

It would appear that only the Yellow-bellied Sapsucker should be regarded as detrimental to tree life, and that all other varieties are to be encouraged. The following article by Dr. Gordon Hewitt, Dominion Entomologist, will be found of value:

Woodpeckers as Insect Destroyers

A Canadian bank manager recently boasted that he had shot seven woodpeckers in succession in his orchard, evidently under the impression that he was performing an exceedingly meritorious service to the community. He was destroying one of our most active insectivorous birds and, though keenly interested in the conservation of his trees and of our forests, he was destroying a most useful ally in their preservation. Boring insects are deadly pests of trees, and woodpeckers are their special enemies, as they are able to reach these pests so secure from other enemies. No birds are more useful in the protection of our forests.

With the exception of the Sapsuckers, our woodpeckers rarely attack healthy trees and are among the most beneficial of our insect-destroying birds. The Yellow-bellied Sapsucker has a black patch on its breast, while the top of the head from the base of the bill is red. These marks distinguish it from all other woodpeckers. It girdles the trees with holes in securing the sap which forms part of its food.

The different species of woodpeckers are the most important enemies of the bark-beetles and timber-boring beetles, these being the chief enemies of our forest and other trees. About seventy-five per cent of their total food is animal food and this consists chiefly of insects, among which the wood-boring beetles predominate. The Common Flicker is a great destroyer of ants, particularly on lawns, as many as 5,000 ants having been found in the stomach of a single bird. The little Downy Woodpecker and Flicker should be encouraged to come into gardens. They will readily accept nesting-boxes and the encouragement of these birds is the best insurance policy that the tree-lover can take out.

PENNSYLVANIA FIRE LOSSES

The report covering the spring and fall forest fire seasons of 1916, issued by the Pennsylvania Department of Forestry, shows that while almost as many forest fires burned in Pennsylvania in 1916 as in 1915, the area burned over was less than half that of 1915, and the timber loss was only a trifle over one-fourth as large.

New Brunswick Probes its Forest Contents

Survey Discloses Interesting Conditions Showing Need Fire for Prevention and Attention to Reproduction

The Survey of the forest possessions of New Brunswick has now reached a point where many very instructive conclusions are available. In making his report to the Government, Mr. P. Z. Caverhill, director of the survey, states that of a total of 7,500,000 acres of Crown Lands, 550,000 acres have been surveyed and examined by the field parties. The mapping and compiling of 371,000 acres have been completed.

Of the total area examined, 82,270 acres have been burned by fires of fairly recent date. Had this area not been burned over there would have been, besides the amount logged from time to time, merchantable timber worth at least $714,000 and the harvesting of this would have yielded the people of the Province through wages, etc. $4,000,000.

Assuming that this burned area represents an average of Crown Lands the loss to the Province in stumpage during the past forty years has been some $14,280,000, and some $80,000,000 that could have brought into the province by the sale of lumber products has been turned elsewhere.

The forest land of New Brunswick could be adequately protected by an annual expenditure of three quarters of one per cent per acre—$50,000 to $75,000 per year. In order to save the expenditure of $75,000 per year "it would appear that we have during the past forty years lost in stumpage $14,000,000 and have turned into other channels $80,000,000."

"Confronted with these facts what will be the future answer to the forest protection question?" asks the report.

What the Survey Shows

On 371,000 acres, 76 per cent was found to be covered with merchantable timber, and less than two per cent with second growth of less than merchantable size. Eleven per cent has been burned in times past but now contains young forest growth in sufficient quantities to replace ultimately the former forest. On nine per cent of the area mapped, fires have caused such damage that satisfactory reproduction has been made impossible. Of the remaining, two per cent, less than half represents the area of lands cleared or cultivated, and the balance is made up of caribou barrens, cranberry bogs, swamp land not supporting commercial growth, etc.

$300,000,000!

If it be assumed that the 271,000 acres mapped to date is fairly representative of the 7,500,000 acres of Crown lands, the total stand will be in the neighborhood of 16,220 million feet, estimated to be worth in stumpage at least $48,000,000. Mr. Caverhill estimates that the harvesting and marketing of this crop will distribute among the people of New Brunswick not less than $300,000,000.

The Timber Contents

The commercial timber on the 282,064 acres of timber land is estimated as follows:

Spruce	139,506	thousand	broad	feet.
Fir	96,627	"	"	"
Pine	19,240	"	"	"
Cedar	34,821	"	"	"
Hemlock	7,474	"	"	"
Maple	30,034	"	"	"
Birch	97,956	"	"	"
Beech	12,838	"	"	"
Other species	8,366	"	"	"
Making a total of	446,862	"	"	"

There is in addition to the above 583,138 cords of spruce and fir pulp, 60,901 cords of poplar pulp, 84,346 cords of white birch spool wood, giving a total of 728,385 cords, which, assuming that two cords will equal one thousand board feet, will be equivalent to 364,192 thousand board feet, making a grand total of 811,064 thousand board feet on the 282,064 acres of timber land, or an average of 2900 feet per acre.

Fire Guarding Reforms

The Canadian Forestry Association is confident that the new Government of the province will not only give to the Forest Survey ample support, but will lose no time in giving effect to the most obvious and pressing requirement of adequate fire protection. To keep fire out of timberlands is the starting point of any forestry policy and by the aid of skilled organization can relieve New Brunswick of further responsibility for gross waste in a highly valuable asset. New Brunswick's present fire protection arrangements as applied to the forests are out-of-date and costly. Given a forestry department centralizing control of the forest survey, timber sales, fire protection and some measure of forestry practice as conditions require and from the first year's operations the province will begin to reap rich dividends.

HON. JULES ALLARD, MINISTER OF LANDS AND FORESTS, QUEBEC,

who has given excellent support to the forest protection cause. By the formation of the Laurentian Forest Protective Association, Quebec has now about 75,000 square miles of its best timber under modern systems of fire patrol.

Forests Give B.C. Treasury Over 2 Millions

Increases in the value of the natural products of the Province produced last year were shown in optimistic reports submitted in Legislature of British Columbia by Premier Brewster in the course of his budget speech. These reports showed the following most satisfactory results:

	1916	1915.
Forest	$35,528,000	$29,150,000
Mines	42,300,000	33,000,000
Fisheries	14,538,320	11,515,086
Agriculture	32,259,157	31,127,801

The estimated value of production in the forest industries was $35,528,000, an increase of more than $6,000,000 over the total for the previous year, and greater than for 1914 or 1913. The production of shingles and boxes has shown a noticeable increase.

Better prices and increased quantity of demand have produced a noticeabe revival in the lumbering industry. As against this, shortage of labor, difficulty in securing material such as wire rope, car shortages, and increased cost of production due to general rise in prices of commodities have exerted a considerable effect in preventing development which would otherwise have taken place. In spite of this the total quantity of timber scaled for the year, 1,280,000,000 feet, shows a twenty-five per cent increase over that of the previous year, this increase being general throughout all districts.

The export lumber trade was severely handicapped by the scarcity of tonnage throughout the year, and the quantity shipped overseas was consequently reduced from 58,000,000 feet in 1915 to 44,000,000 feet in 1916. Placed as she is, British Columbia will have every opportunity of doing an important export trade when the tonnage situation is re-established. Such trade was particularly desirable as a stabilizing influence, so that the Coast industry may be less dependent upon the Canadian Prairie market. For the past year, however, the Prairie demand has been most satisfactory, while shipments to Eastern Canada were double those of the year before. Persistent effort is made by the Provincial Government to advertise the merits of British Columbia forest products and to assist manufacturers who are entering new markets.

Including nearly $180,000 from the taxation derived from the crown grant timber lands, the Province drew from forest sources in 1916 a revenue of $2,000,000 which is slightly in excess of the amount for 1915. For the coming fiscal year the direct forest revenue, apart from such taxation, is estimated at $2,300,000, an amount including various royalty arrears which are now being called in. The improved outlook is shown by the fact that last month's forest revenue was the largest since the war began, while the collection for the month from both royalties and timber sales broke all previous records.

There is, at Ottawa, an independent Society numbering four thousand five hundred members, and known as The Canadian Forestry Association. Its object is the conservation of our forests from preventable waste, and it does so by spreading timely and useful information amongst those interested. I have just received from this Association a little leaflet headed "Who loses?" and am requested to pass on some of the facts contained therein. It may be remembered that this subject was dealt with in these notes about a year ago, when I tried to show how vitally the forest reserves of Canada affected us all, and to point out the necessity of preserving them from unnecessary destruction.—*Melfort, Sask., "Journal"*

"You are drawing the blood of a future generation in Canada when you misuse the forest resources of the country."—Sir George E. Foster.

Four Fire Associations Now Blanket Quebec

Covering 75,000 Square Miles of Province's Best Forest Land, With Great Gains for Timber Saving

Quebec's remarkable development of forest protective associations during the past four years was given a further impetus on April 26th by the formation of the Laurentian Forest Protective Association at Quebec. This latest grouping of limit holders takes in the Lake St. John and Saguenay country where fire losses have been substantial during many years. The area is about 15,000 square miles and extends from west of Lake St. John as far East as Mille Vaches, beyond Tadousac. Hon. R. Turner of Quebec is President and R. L. Seaborne, manager. Organization of the territory commenced at once and with good inspection service, permanent improvements, etc. Mr. Seaborne's area will doubtless take rank with the best patrolled districts in the province.

There are now four associations of limit holders in Quebec: the Ottawa River; St. Maurice; Laurentian; and Southern St. Lawrence; covering approximately 75,000 square miles of the best and most accessible timberlands. The provincial government contributes one, the costs of patrol and fire fighting and leaves the details of management, appointment of rangers, etc. entirely in the hands of the associations. By this means Quebec is securing a degree of forest protection vastly better than under the old system.

The method will probably not be applied in any other province. Ontario has definitely chosen to impose a fire tax on every limit holders and place the responsibility of selection and management of patrol, etc. in the hands of the Provincial Forester, thus allowing to the licensee no authority in fire protection matters. British Columbia also follows the plan of taxing the licensee for fire protection purposes and retaining control of the ranger staff under the Forest Branch.

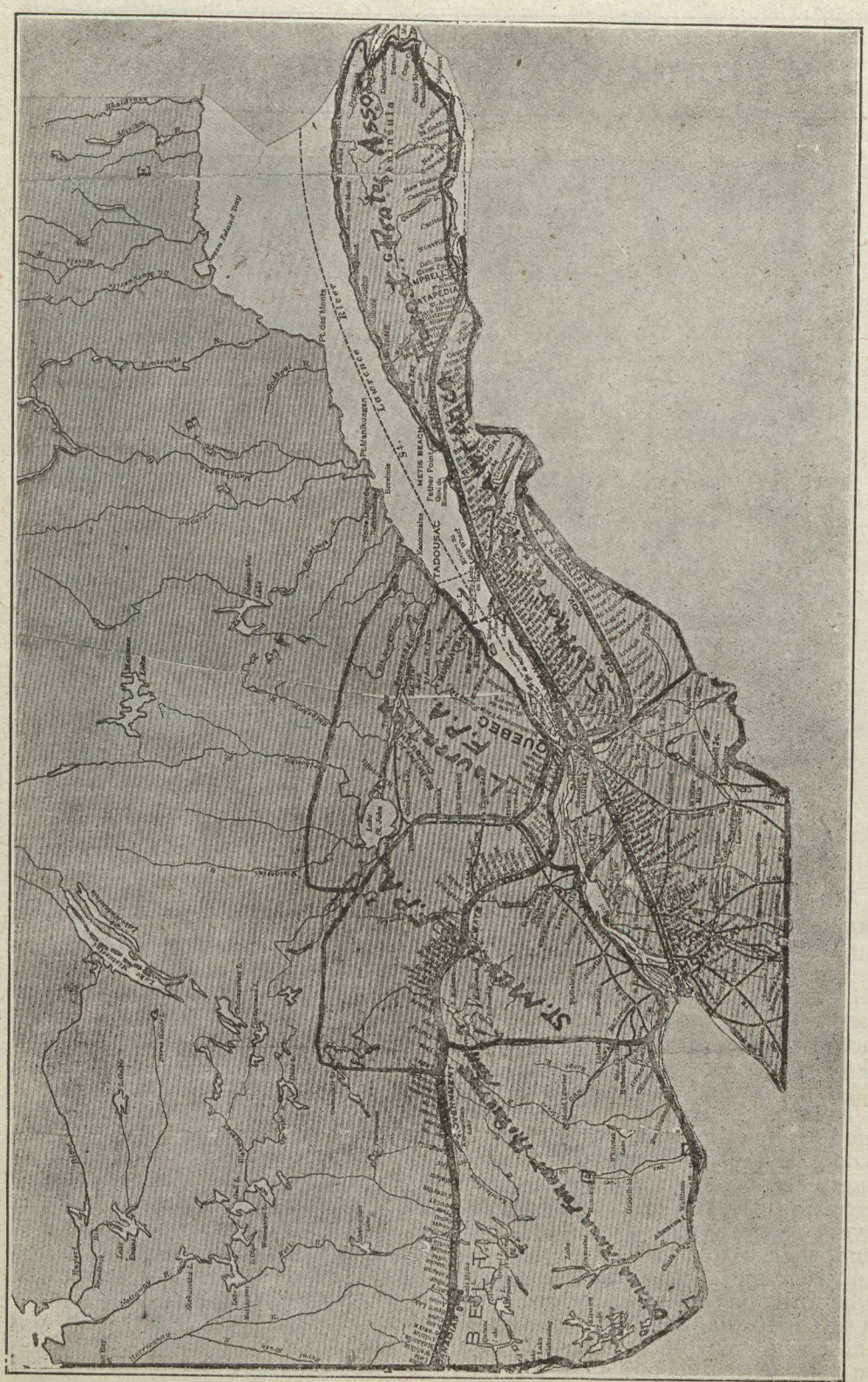
VALUE OF RUSSIAN STUMPAGE

In normal times before the war, export of Russian lumber amounted to about 5,000,000,000 super feet. This lumber was chiefly cut in government forests. This quantity, compared with the enormous forest stands of Russia, was so small that it gave the Russian treasury an amount of only something like 20,000,000 roubles gross, or 10,000,000 roubles net, which amounts in American currency to about 16 cents per acre.

A study of the possibilities in the lumber trade after the war made by the Russian government, shows a probability of an increase in the demand of Great Britain, France, Holland and Belgium for Russian timber, amounting possibly to about 3,750,000,000 super feet, which would bring the possible total demand for Russian timber to 8,750,000,000 super feet. According to the nature of the northern Russian forests, this figure represented in sawn material, would mean a cutting of about 20,000,000 logs.

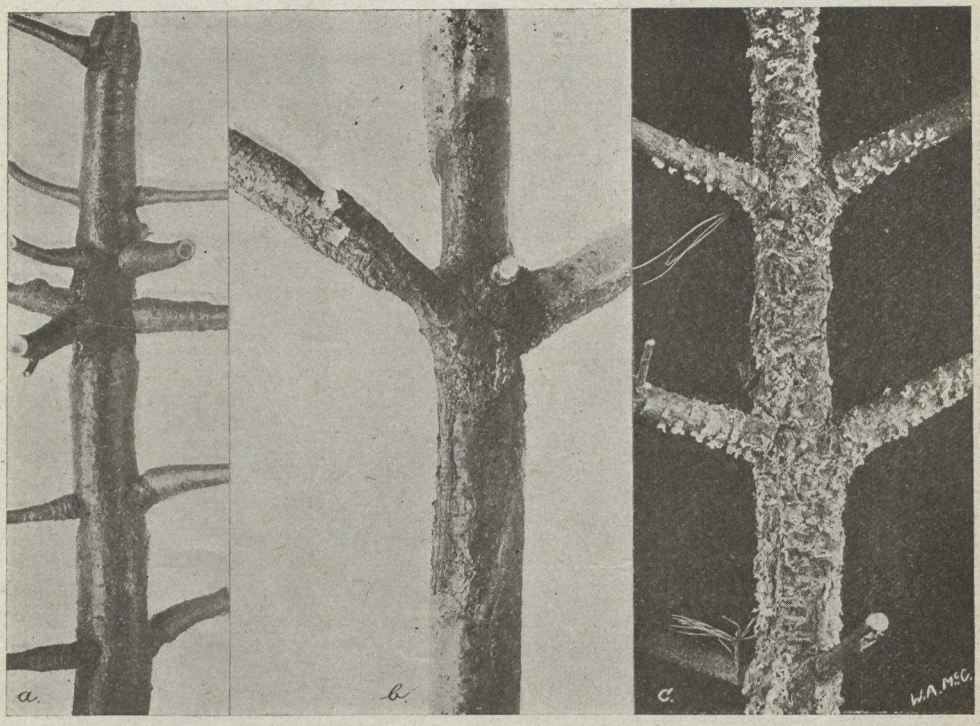
B. C. WATERSHED DISPUTE

One of the subjects now being popularly discussed by the citizens and press of Vancouver is whether the timber on the Capilano watershed, from which the city's water supply is obtained, can be logged without danger to the water system.



GOVERNMENT RAILWAY MAP OF PROVINCE OF QUEBEC
showing the boundaries of the four Forest Protective Associations : Ottawa River, St. Maurice, Laurentian, and Southern St. Lawrence, which include the most valuable timber of the province.

Warning Re White Pine Disease



WHITE PINE BLISTER RUST. Photos by W. A. McCubbin.
(a) Early stage of white pine blister rust showing typical swelling.
(b) Branch of white pine completely girdled by disease.
(c) Appearance of infected white pine during May and June.

These are days when everyone in or near white pine ought to be scouting for white pine blister.

The following is taken from Dr. Gussow's excellent pamphlet, written for the Canadian Forestry Association. Copies with detailed illustrations will be sent upon request.

"The first and most essential point is to know the disease. If everybody made it his business, when in the woods, every camper, every hunter, every Boy Scout, every lover of our beautiful forests, and, most of all, every forester and wood man, from lumber-jack to owner—to know, recognize, and immediately report, where the disease was observed, and, if in doubt he send a specimen to those who know it, then we may hope to cope with it before it is too late.

The disease is most of all dangerous to the young pine. When it attacks the main stem,—and as many as one hundred separate infections and more have been observed on one tree—and girdles it, which it is sure to do eventually, the tree dies. *During May and June each year*, this disease can be recognized by any one looking for the following symptoms even if we have no training; later on, only experts can determine it. All know the appearance of the fine smooth dark green bark of stem and branches of this white pine. But does everybody know the white pines from other pines? Of course he knows that the white pines have five needles or leaves in a cluster, while others have but two or three. To make sure of this, he need only cut or pull off a cluster

of leaves where they are attached to the branch, and count that little cluster held together at the base by a small sheath—if there are five needles it is almost sure to be a white pine—and even if not, (this disease only attacks five-leaved pines) it should be reported nevertheless.

During May and June, rarely after the middle of June, the disease is most conspicuous on the pine. The formerly smooth dark green bark will be found swollen, puffed up, "blistered," and breaking through the bark will be seen small whitish-orange scale-like bodies of a dusty floury appearance, composed of the spores or seeds of the disease. There may be a few or many at each point of infection. Often times one can see these from a short distance. They may be on any young branch or on the older wood, but they disappear after June, and only the blister remains, though far less pronounced to the casual observer.

Where the scales had been are often small drops of resin, or gum in the popular phrase, though these are not always present,—(or may be present from other causes),—since even mechanical injuries to the bark, such as squirrel bites, etc., will cause gumming. In time, this bark becomes rough and cracked, the disease slowly makes progress up and down, or around the limb or stem, and kills the branch, or the tree if it has girdled the stem; or the wounded area may give rise to another series of spores, but at no other time of the year except May or June, will the spores be seen. In old pines the disease may live for years; young pines will succumb as soon as the main stem has been girdled.

The symptoms should be carefully borne in mind, and always looked for, when one is in the woods in May and June."

Anyone noticing symptoms of the disease on white pine ought to notify at once the Provincial Forester, Toronto, Ont.; Provincial Forester, Quebec; Minister of Lands, Fredericton, N.B.; F. A. Harrison, Deputy Commissioner, Parliament Buildings, Halifax, N.S.; the Dominion Forestry Branch for infections in Manitoba, Saskatchewan and Alberta; the Provincial Forester, Victoria, British Columbia. The white pine area from the western boundary of Ontario to the Pacific is very small, and no contamination there has been reported thus far. The chief white pine sections are in Eastern and Northern Ontario and Western Quebec and through New Brunswick.

TREE FALLS, KILLING 11

One of the worst accidents in the history of logging in the Pacific Northwest occurred March 23, at the operation of the North Bank Logging Co., Grays River, Wash., when eight men met instant death and 15 others were injured, three of whom later died. The logging crew was returning to camp for dinner at noon, standing and sitting on two flat cars. An 18-inch hemlock tree, uprooted by the high wind, fell across the head end of the first car, sweeping the men off the cars before the train could be halted. The injured men were hurried to Astoria. Of the men in the hospital on April 10, all seemed sure of recovery with one possible exception.

DECAY OF FIR

A detailed investigation of the rate of decay in mature stands of Douglas fir will be undertaken within a few weeks by Dr. E. P. Meinecke, of San Francisco, pathologist assigned to the Forest Service by the Bureau of Pathology. How decay attacks the tree and how it progresses will form an important part of the investigation, which will be carried on in several districts in Washington and Oregon.

COMPULSORY PATROL

Some amendments to the Washington forest fire law will probably be offered at the forthcoming session of the legislature. The compulsory patrol system in force in Oregon has worked out very satisfactorily and will probably be adopted by other Pacific Coast states.

Federal Gov't Assists in Fight Against White Pine Menace

Hon. Martin Burrell, Federal Minister of Agriculture, has decided upon a plan of co-operation with the provinces for checking the white pine disease of blister rust which is bound to prove of utmost advantage.

Representations as to the seriousness of the blister disease in Eastern Canada were made to the Minister by the Canadian Forestry Association, Commission of Conservation, and by pathologists of the Department of Agriculture. The Minister gave the question prompt and thorough consideration and arrived at a decision which every friend of forest conservation in Canada will recognize as practical and praiseworthy.

The Minister will ask Parliament this month to sanction an expenditure, understood to be above $50,000, in order to assist the provinces in locating infections. This involves a great amount of work in scouting, with constant travel, and a large staff of inspectors. Conferences with the Provincial departments of Lands and Forests have resulted in an agreement that the provinces should engage as many men as will be necessary for the task and pay their salaries. The Dominion appropriation will meet the travelling expenses, which makes the division of cost about equal. The responsibility for results and authority in directing the work is left with the Provinces.

Mr. W. A. McCubbin, who has been engaged on pine blister work in the Niagara Peninsula for more than a year will take general supervision of the work on behalf of the Departmentof Agriculture, visiting Ontario, Quebec and New Brunswick.

With this plan in operation, there should be by the Fall a fund of information as to the districts affected by the white pine disease, and such knowledge will be a guide to the provincesand Dominion in future action.

THE PATRIOT'S VIEWPOINT

Ontario, Feb. 9, 1917.

Canadian Forestry Association:—

Enclosed find our cheque for five dollars, Contributing Membership Fee, to help the spread of information how to preserve our forests and make good our waste. E. D. S.

Prof. W. N. Millar, of the University of Toronto Forest School has arranged to enter the service of the United States Army of which he is a reservist and will leave Toronto about the end of May.

Mr. R. L. Seaborne, Manager of the newly formed Laurentian Forest Protective Association, has had valuable experience as an inspector of the St. Maurice Forest Protective Association.

T. B. Molloy, assistant superintendent of insurance, Winnipeg, has assumed charge of the fire prevention branch and is busily occupied in organizing the municipal officials who will, under the new law, report all conflagrations, with causes, damage, etc., to the department at Winnipeg.

UNUSUAL PHOTOGRAPHS PURCHASED

Rangers and others having unusual photographs of any subject identified with the forest are asked to submit them for examination to the Canadian Forestry Journal, 119 Booth Building. For those available, one dollar each will be paid. Pictures must be clear, sharp, and of a minimum size of 3¼ by 4¼.

Strange Ways of Using Wood Pulp

Paper Lamps, Chimneys, Paper Umbrellas, Boots, Boats, Wheels —a Few New Uses for the Tree

There are probably no commodities in established use which have so greatly extended their sphere of utility as wood-pulp fibres and paper, and within recent years the novel uses to which they have been, and are still being placed, have enormously increased in number. Mr. Gladstone is our authority for the statement that even 60 years ago the uses of paper were varied and numerous. In the speech to which we have just referred he stated that he had a list of 69 trades in which it was used. "For example," he said, "it is largely used by anatomical machinists to make artificial limbs; by telescope makers, by boot and shoe makers, by cap manufacturers, for the foundation of caps and hats, forming all the peaks and many of the tops which look like leather; by china and porcelain manufacturers; by doll makers, and by shipbuilders; and again in making optical instruments, in pictures and looking-glasses, in portmanteaus, in Sheffield goods and teapots." "One manufacturer writes," Mr. Gladstone continued, "that he has made panels for doors from paper, and above all he looks forward to making carriages of paper when the duty shall have been taken off. Another manufacturer, who is asked into what combinations paper may be made to enter writes to me: 'Who can fix the limit to ingenious combinations when we see India rubber being made into strong and durable combs and other articles of that sort? Only this morning I was informed that paper pipes are actually made prepared with bitumen and capable of standing a pressure of 300 pounds of water to the inch.'" This was nearly two generations ago, and during the intervening years it has become increasingly recognized that not only may paper be found useful for other than printing, writing, and packing purposes, but that wood-pulp is capable of being advantageously used in the manufacture of other goods than paper and cardboard. Pulp and paper, says the British Paper Trade Journal, have furnished a rich field for exploitation, and in altogether new spheres of usefulness have arrived at a stage which may be said to guarantee their permanent serviceability. Nowadays, the public are familiar with artificial silk, coarse cloth, and fabrics closely resembling mercerized cotton produced from wood-pulp fibres, and it is stating nothing new to say that ties and waist-coats are being made from pulp and paper. As a matter of fact, both pulp and paper can now be formed into solid substances capable of competing with wood or iron in point of durability and elasticity, and for some years past, treated by special methods, they have been converted into such articles as paper bottles, figures, ornaments, furniture, etc. Waterproof coverings for walls and ceilings, parchment slates, flanges and manhole rings, paper wheels, roofing and boats, paper barrels, gas pipes, boxes and horse-shoes are also no longer novelties. Probably one of the most valuable by-products of the manufacture of sulphite pulp is that of spirit from the waste, and particularly in Sweden, the distillation of alcohol from cellulose bids fair to become an industry of considerable importance. Then it is but a few years since the chairman of the tanning section of the Toronto Board of Trade declared that paper inventions had gradually entered into competition with leather, and that hides had advanced in price to such a degree that the output had dropped 50 per cent. in Canada, a condition of affairs which had compelled the use

of such substitutes as fabrics and paper.

Building Board

Paper as an article for building purposes is well known in Scandinavia and Japan. In the latter country not long ago a country house was entirely constructed of paper, and in Scandinavia a great quantity of wood pasteboard is used as the lining for wall papers, while in the United States a heavy paper board for use in building operations is also made from waste sugar, sugar cane and corn stalks. In a small mill at Koyasa, Kanagawa (Japan), waterproof paper is now manufactured for shirt-making.

Paper string and twine has within recent years come to be recognized as a valuable substitute for the ordinary variety. Paper string is now being made of such stoutness that it is suitable for tying up parcels of quite a fair size, and its manufacture is now being carried out in this country. Twine has been produced from paper in Germany for some years; the cord is spun from strips of brown or white creped thin cellulose paper, and the few mills making it are said to be unable to meet the demand.

Paper Umbrellas

Making artificial flowers from paper is not a new idea, but it is probably not so well known that they are now being made of paper rendered non-inflammable by the moderate use of asbestine. It may also be recalled that a demonstration given in Toronto a short time ago samples of sections of chandeliers, lamp brackets, etc., made from sulphite pulp, which had been subjected to a very high pressure and then blown into metal moulds were shown, while paper lamp wicks are said to be now replacing cotton wicks throughout Austria-Hungary. The Japanese sunshade is, of course, quite a familiar object, but the collapsible and storm-proof paper umbrella, devised for use in emergencies by an ingenious American, has not yet obtained wide favour. Tests, however, are said to have shown that with ordinary care the cover will last for months in heavy rain and strong winds.

Paper Lamp Chimney

Twisted or hardened paper is also being extensively employed at Sheboygan, U.S.A., in the manufacture of paper furniture, and bags and trunks of compressed paper are perhaps somewhat better known than the paper jackets for sausages, which have been introduced on the other side of the Atlantic. Vulcanized fibre, which is simply paper treated with zinc chloride, is also being extensively used in the manufacture of tool handles, bobbins, tubes, etc., and paper binder twine, paper window shades, paper matting and paper floor coverings, the latter generally made with an admixture of cotton, are now widely used. Paper insulators are, of course, in comparatively common use, but it must be admitted that a paper chimney, of which we have heard, is something of a novelty. Paper cartwheels and paper boats are, however, no longer curiosities, though it is stated that the paper boat is, indeed, a very substantial and serviceable craft.

The great war has also developed new uses for paper and pulp. It is now well known that Germany is using chemical pulp in place of cotton as a basis for the production of high explosives, and a German military surgeon goes as far as to say that not only cellulose wadding, but mechanical wood-pulp, wood flour, wood wool and wood felt have done good service as substitutes for cotton in making dressings, while another authority states that for wound secretions, filter and blotting paper serves the purpose admirably. Cellulose wadding is used in dozens of forms as a substitute for cotton, and its employment is stated to be even more advantageous when loosely cotton woven cotton wicks are substituted for closely woven wicks, particularly in spirit and petroleum lamps. There have also been stories of paper boots and paper socks worn by soldiers of the European battlefields, and it is reported that paper beds, with paper sheets and pillow-cases, are now being used in Germany by the poor, the mattresses being made of strong sheets of paper pasted together and filled with dry leaves of beech and

A WINTER FOREST SURVEY PARTY IN NORTHERN SASKATCHEWAN.

oak trees. The paper used is toughened by a special process which prevents easy tearing. In this connection, it may be mentioned that recently in Copenhagen a new German textile, in which paper is spun with about 20 per cent. of cotton, was exhibited. From this, paper underclothing, sheets, jerseys, bandages and horse blankets were made, but it is admitted that the cost of production is too high to allow of its competing with cotton and woollen cloth in normal times. Probably the largest use of spun paper in the United States lies in the manufacture of fibre rugs, in the production of which no fewer than twenty-five factories are engaged, one of them turning out something like twenty-five tons of rugs daily. Most of these rugs are made made entirely of paper, but in some instances an admixture of cotton or wool is used. The possibilities for sulphite pulp in the manufacture of toys was a topic upon which Sir George Foster recently dilated at a manufacturers' convention in Toronto, and at a school near Southport, waste paper, after being pounded and kneaded, is now being used in place of clay for modelling purposes.

Altogether there seems to be no limit to the potential uses of either pulp or paper, and there is no doubt that in the near future considerable developments in this direction will have to be recorded.

NEW FORESTRY FIRM

C. A. Lyford and H. E. Brinckerhoff have formed a partnership under the name of Clark & Lyford for the practice of Forest Engineering, with headquarters at 15 E. 40th St., New York. They will act as Eastern Agents for Clark & Lyford, Ltd. of Vancouver.

THE NEW ASSOCIATIONS

In the formation of the Southern St. Lawrence Forest Protective Association, the majority of the limit holders and owners of free-hold lands, from the county line between Dorchester and Bellechasse right down to the Gaspe peninsula will have one President, and one Secretary-Treasurer, but will divide the territory in two sections, the Eastern and the Western, each Section to have a vice-president and Manager chosen by a board of five Directors; the whole Board of ten directors will have charge of all matters pertaining to the whole Association, but each Section will be independent so far as funds and administration are concerned.

Appointing Rangers on Personal Merit

The long overdue task of subduing the patronage evil in appointments to the Civil Service has been commenced in British Columbia. The Forest Service is the first to benefit. Following protests by the lumbermen's organizations, Canadian Forestry Association, Commission of Conservation and others, against further toleration of the patronage plan in forest protection, the Brewster Government inaugurated a scheme of two examining boards, having jurisdiction over appointment of rangers in the Coast and the Mountain sections. The original proposal was that the lumbermen should control these boards, but this was modified to retain responsibility in the hands of the Government who have three members on each body of five. Already the plan has been set in motion so as to apply to ranger appointments in the present fire season. Written and oral examinations are required and while the time allowed to the British Columbia Forest Branch for preparation was embarrassingly brief, the intention of the Government is being thoroughly carried out. Applicants were notified of the examination dates and in some instances more than one hundred men appeared to stand their ordeal. Sixty per cent. was allowed for experience. Upon the decisions of the examiners all ranger appointments will be made hereafter. As a substitute for the vicious system of appointment by stealth, known as the patronage plan, the British Columbia arrangement is a valuable step forward and may be the means of leading other provinces and the Federal Governments to try the Civil Service idea on their field appointments.

Forest Survey Made With Camera

Unusual methods were adopted in making a survey recently of the Columbia National Forest in the state of Washington, which comprises an area of over 1,000 square miles, mostly rough, hilly, and heavily timbered land, difficult and expensive to survey in the ordinary manner. With the aid of a photographic outfit, however, a satisfactory survey was made by one member of the Forest Service, who covered 93 square miles a month on an average during the progress of the field work. This has occupied several open seasons, the winters being spent in working up the field notes into accurate maps showing the contours and all streams in the forest. The surveyor was accompanied by one assistant and packer, and traveled on horseback, with two pack animals. Observations and photographs were made from definite "stations" when the weather permitted, about 15 such stations being occupied each month. Four exposures were usually made with the camera at each station, each plate developed taking in the view within an angle of 65 degrees. Each photograph was marked on its margin with a horizon line by which elevations and depressions were subsequently measured for map making, and it was found that the contours drawn by this method were surprisingly correct, usually coming within 50 feet or so of actual elevations. About 50 square miles were mapped each month when field work was impossible the scale used being 1 in. to the mile. The total cost for field and office work was approximately $4.60 a square mile, which is regarded as low, compared with the cost of ordinary surveys.

Impressions from India

The first shock to a Canadian travelling in India is the wooded state of the country. One expects that hundreds of millions of people warring through thousands of years and finally under a century of peace crowding agriculturally 300 to 600 to the square mile would have produced a denuded land. Such is not the case —except in the arid Indus valley— the whole land, viewed from a railway carriage, appears forested, and even the Ganges plain with its agricultural half thousand to the square mile is so dotted with trees as to appear at a distance of less than a mile an unbroken wall of forest. The temperament which leaves trees to grow, in groves, rows and scattered throughout the most valuable fields without even the protection of the fence row, which saves a few trees in America, must have been an important factor in leaving any forests for the British to administer in India.

The forest area of British India now stands at about 336,000 square miles, or 31.1 per cent. of the total land area. Though the forest cannot all be considered as productive timber land, or even as wooded land, as will be explained later, the proportion of actual forest must to a Westerner appear very large, especially when the age, history and population of the country are considered.

The large proportionate area of forest is explained by three or four conditions wherein India differs fundamentally from American conditions, which act as brakes on forest destruction in India.

Recent Canadian experience to the contrary, the Indian is not an emigrant. The strongest human tendency in Canada and the United States has been to move west along the parallels of latitude and destroy forest. The native North American has not waited either for pressure of population upon the land or for a market for the timber in the virgin Western forests to furnish the stimulus for the Western movement of population. The Indian, the direct antithesis of this man, even when the agricultural population has reached 600 to the square mile; has not felt impelled to leave his ancestral paddy field and move a few hundred miles to another part of his native province or to another province of India, even though bountiful paddy fields have already been proved there, settled government established and railroads laid down for easy transport.

The Indian will assuredly cut down the forest bordering his field and village if allowed, but he will not migrate to attack a new forest area. Nearly every province contains a fair proportion of forest, some if it seemingly on good agricultural land and only a hundred miles or so from districts so densely populated that to use Kipling's description of Canton you feel that if you knocked a corner off a house it would bleed. Other provinces, rich beyond dreams, in the capacity for growth of myriad crops, such as Assam and Burma, lying in the direct line between the hordes of China and the swarms of India to this day cry aloud for population and all through the past have suffered little or no forest destruction.

A large proportion of the forest wealth of India is in these two provinces. If they are omitted the forest in India sinks to 21 per cent of the land area. One should be permitted to dream a moment what would be the situation in North America today if we had possessed only a little of the Indian's characteristics of pausing to make each acre fertile before passing on to denude another. We should have been still somewhere East of the Appalachians and the beaver would not yet have been driven out of Canadian rivers to take refuge in the folds of the flag.

H. R. MacMILLAN,

(Former Chief Forester of British Columbia.)

PRESENT STATE OF FORESTS IN PRAIRIE PROVINCES

A most interesting and informative estimate of forest conditions has been furnished by the Dominion Forestry Branch at the request of the Canadian Forestry Journal. It deals with the results of examinations by Forestry Branch reconnaissance parties of about 100,000 square miles north of the prairies in Manitoba, Saskatchewan and Alberta. On this area, which is accepted as typical of the bulk of the tree-covered lands (the complete survey of which will be completed in about two years)

about 6 per cent. is grassland or prairie,
about 3 per cent. is water,
about 23 per cent. is muskeg or slough,
about 55 per cent. is covered with more or less good reproduction verging in size from seedlings to trees 8 inches in diameter, B. H. This includes also recent burns where the reproduction may as yet be very poor or altogether lacking.

About 13 per cent. of the area is covered with timber of merchantable size, 8 inches or more.

This estimate is at once a tragic testimony to past neglect and a reminder that only by resolute conservation policies beginning with exclusion of fire and on through replanting to a scientific plan of utilizing mature timber will the timber resources of the prairie provinces prove equal to the requirements of future population. If, as claimed, the future of Canada depends upon heavy immigration, the hope of immigration depends not upon bare land merely, not upon wider markets merely, but upon holding down the costs of production, in which the cost of lumber and fuel, fence posts and other wood supplies bear such a substantial part. As the cost of wooden pit props affects the price of coal, or the cost of barrels affects the selling price of fish, so the thousand-and-one products of the forest that enter into a modern farming plant will retard or send up the production cost of wheat and live stock according as the storehouse of the provincial forests is in a flourishing or depleted condition.

The forests of Alberta are primarily for Alberta's use. So with Saskatchewan and Manitoba. Each province gets all the dividends of conservation, by whomsoever applied.

THRIFT IN FOREST FIRES

There are estimated to be 10,000 forest fires in Canada every year of all sizes and descriptions. Nine-tenths are set by human hands, and the damage runs from four to ten millions of dollars, not counting damage to soil, to the value of watershed areas and many other factors.

"Thrift in forest fires" is a new movement which the Canadian Forestry Association has started amongst the guides, and campers and sportsmen of Canada with a view to cutting down the country's timber losses in 1917. As is well known, the present-day causes of forest fires are not the railways as much as the settlers, campers, hunters and fishermen. Thoughtlessness in respect to camp fires, the throwing away of lighted tobacco, matches, etc., has caused some of the worst conflagrations in history. During the months of May and June, before the fire season is well under way this year, thousands of out-doors men are being asked by the co-operation of the newspaper publishers of Canada to make 1917 a year of thrift in the forest.

Education by Public Lectures

The sets of fifty lantern slides and lecture manuscript, sent out without charge by the Canadian Forestry Association to clergymen, teachers, and others in a position to gather an audience, have been extensively used during the past four months.

As an example of the manner in which these lecture sets are employed, the following appeared in the Keewatin, Ont. "Enterprise" of April 21: "An interesting lecture on lumbering and forest protection, illustrated by lantern slides was given in the Oddfellows' Hall on Monday evening under the auspices of the Canadian Forestry Association. The Hall was well filled. Messrs. A. G. Holmes and D. McLeod (Manager of the Keewatin Lumber Co.) gave interesting addresses pointing out the great importance of the lumbering industry in Canada and the necessity of protecting the forests for future supply."

A note from a Keewatin correspondent adds: "There were about 150 children present and an equal number of adults. Each of those present was presented with a copy of your booklet, "Your Enemy's Photograph" and also a copy of the booklet for campers. The people appeared to be very interested in the meeting and we are satisfied that good results will follow."

Another of these lectures was given at Knowlton, Quebec, by Rev. Canon Carmichael before a very large audience, Hon. Sydney Fisher, President of the Canadian Forestry Association being chairman.

The call for these lecture sets from all parts of Canada is beyond the Association's financial ability to meet as it should be met.

As far as the revenues will allow, however, this part of the propagandist work is making headway. At least ten lecture outfits could be employed the greater part of the year, by designing each lecture to apply especially to the Maritime Provinces, Quebec, Ontario, and three prairie provinces, and British Columbia and operating each from a provincial headquarters.

Developing the Forests of Alaska

Discussing the opportunities for the development of the forests of Alaska for paper manufacture, Henry E. Surface, engineer of the United States Forest Service estimates that an initial investment of $2,000,000 for a 75 ton mill would be necessary.

"Probably the most important obstacles holding up serious consideration of Alaskan pulp and paper enterprises by parties well able to finance them are the undeveloped conditions generally existing and especially the lack of detailed information on specific local resources and facilities." Continuing the report says:

"So far as legislation and the regulations of government departments are concerned, there are no obstacles to the development of pulp and paper enterprises and the use therein of the necessary sites, timber, water powers, and other natural resources of the public lands; in fact the terms of government lease, permit, sale and title may be considered encouraging even for pioneer conditions and capital may be assured of ample security in these regards." Taking up the question of Timber on the Tongass Forest, Mr. Surface says:

"The present stand of merchant-

able timber on the Tongass Forest is estimated at 70 billion feet and as only the best of the spruce, cedar, cypress and possibly a little of the very best hemlock, is now considered as saw timber, it is evident that for pulp purposes which can include all of the hemlock as well as the spruce in sizes and grades not at present called merchantable, the estimate is very conservative. The area of the stand is estimated at 8,000,000 acres with an average stand of 9,000 feet per acre. Assuming new growth at the very low rate of 25 by 30 feet b.m. per average acre per year, the reproduction alone would perpetually support newspring paper mills of 1,000 tons combined output per day or five mills the size of the big Powell River concern in British Columbia." Taking up the question of the accessibility of the timber, the report continues:

"At present hand logging is much in vogue, but logging with machinery is gradually coming in and would be used on all the proposed pulp chances. The Tongass Forest has about 12,000 miles of timbered shoreline and the bulk of the timber can be easily brought to the water and rafted or boomed for towing to its destination through the well-protected waters. Present logging costs from stump to boom, even under the more efficient operations, will generally fall between $4 and $5 per 1,000 being tolerably uniform for all accessible areas within a mile of the shore. Towing is very inexpensive, being about one per cent per 1,000 feet b.m. per mile, except for the shorter hauls. For these reasons it is not essential that a pulp mill should be located on the area from which it gets its timber.

U. S. SEEKING OUR WOOD

Mr. K. C. Clark, of Oldtown, Me., in a recent interview with the St. John, N. B., "Telegraph," stated that United States lumber firms in the east are reaching out more and more into Canada for material, and that within another five or ten years almost all the large lumber mills in Maine will have been converted into pulpwood and pulp mills.

TIMBER FOR SHIPBUILDING

Every local freight train on the N. T. R. is carrying east in carload lots spars and other special timbers needed in the construction of wooden ships, an industry which is experiencing a great revival at various points in the Maritime Provinces, says the Times of Moncton, N. B. Some of the shipments consist of heavy timbers to be used for masts and spars of wooden vessels. There is also considerable shipment of planking and wooden ribs for the vessels. The most curious part of the shipments, however, are the wooden "knees" which are really the crooked roots of trees, sawed into sizes suitable to shipbuilding purposes. These "knees" can be made from ordinary timber, but builders prefer the natural bend of the roots, which are very fibrous and tough. Quite an important part of present day lumbering operations is the digging up and cutting out of crooked roots suitable for this purpose. The small knees are used for bracing stem and stern posts and similar parts exposed to heavy strains.

SUSPEND FOREST SCHOOL PLANS FOR PRESENT

The task of building up revenues to meet expenditures has rendered necessary the postponement of the plan for commencing a Forest School in connection with University of British Columbia as well as the proposed scheme for a Forest Products Laboratories to assist the British Columbia timber industry in many of its special problems. New tax adjustments are expected to overtake the deficit in current expenditures during the next twelve months and it is understood that no time will be lost in giving effect to the plan for the Forest school and Laboratories at Vancouver.

SOME FORE-HANDED THRIFT WOULD HAVE HELPED HERE

Building a Camp Fire

As this issue of the Journal will find hundreds of our readers planning summer vacations in the woods, the following article is reprinted from an earlier issue in order that all may take advantage of the hints on building a camp fire.

Camp stoves should be taken whenever they can be transported. They are safer than open fires, more convenient, require less fuel, and do not blacken the cooking utensils. Collapsible sheetiron stoves may be obtained.

In the absence of a stove an open fire must be built. A safe and serviceable fireplace can be made of rocks placed in a small circle so as to support the utensils. Where rocks are not obtainable, poles may be used.

For permanent camps it pays to build a stone fireplace. A piece of sheet iron will prevent the blackening of the pans and makes a better draft.

For temporary camps the fire should be built as follows:

Dig a hole about a foot deep and about three or four feet in diameter. Shovel away the side toward the wind. Lay green poles across the hole to support the pots and pans, and build the fire underneath.

Fire irons are often a great convenience. A piece of three-eighths-inch round iron four feet long is bent at tight angles a foot from each end and the ends are sharpened. Two of these irons are placed side by side, the ends are driven into the ground and the fire kindled beneath them. Instead of being made in one piece, the pegs and cross-bars may be connected by rings in the ends. They will then fold and be easier to pack.

Small Fire is Best

Camp fires should never be larger than necessary, and the utmost care

should be taken to prevent sparks from being carried into the neighboring forest. Clear away the litter for a considerable space about the fire. And be sure to *put the fire out* before you leave it.

A shovel is nearly as important a tool as an axe in camping. Do not count on finding one along the way, but put one in your outfit.

During wet weather look for kindling in burned pine, or in pine knots. The under side of a leaning tree will usually contain dry material. Dead branches, that have not yet fallen are drier than those on the ground. Bark from fir snags is excellent fuel.

Where matches are scarce or when the weather is stormy, first light a candle and kindle your fire from that.

Hints on fire protection are always timely and fit particularly well with these instructions about camp fires.

The first thing is prevention. Bear in mind the Six Rules. Be particularly careful with camp fire, matches and tobacco, since carelessness with these is punishable by law.

Scrape all inflammable material from around the fire before lighting it. Make a fireplace either by digging a hole or by piling up rocks. The fire will then not only be safer but will draw better.

Before leaving camp see that the last spark is extinguished. Pour water on the embers and then cover them with earth.

Don't make your fire too large. Large fires are not as convenient to cook by as small ones and are more trouble to put out.

To Overcome Fire

If you discover a fire, go to it at once and put it out if you can. A small fire can be put out easily by throwing handfuls of earth or sand at the base of the flame. The flames may also be beaten down with sacks or with branches, but care must be taken not to scatter the fire.

If the fire is spreading too rapidly to be attacked directly, cut and scrape a trail some distance ahead of it. Do not back-fire; this is work for an experienced man. If a fire is serious enough to require this treatment, the work should be left to a ranger.

The best tools for fire fighting are the shovel, axe, and hoe or rake. In open pine forest very little axe work will be required. Shovel or rake a trail through the needles down to mineral soil, and guard the trail.

To stop a fire burning in brush the trail must first be cut with the axe and then scraped. The brush should be thrown to the side away from the fire. The litter may be scraped toward the fire.

Pick a route for the fire trail that will avoid brush patches if possible. The crest of a ridge is an excellent location, since the fire naturally checks at the top.

See that a fire is cold before you leave it.

Report all fires to the nearest forest ranger, or railway agent, or settlement

Do not suppose that because a fire is merely burning in apparently worthless brush it is therefore doing no damage. Such fires are often the most serious.

Postscript: There are about 10,000 forest fires in Canada every year, over 1,300 a month between snow and snow.

1917 IS A YEAR OF THRIFT. LET'S CUT THAT 10,000 FIRES IN HALF!

SURVEY FOR LAURENTIDE CO.

Dr. Howe, of the University of Toronto, with two technical assistants, will commence for the Commission of Conservation and in cooperation with the Laurentide Company, Limited, a survey of the cut-over pulpwood lands. This survey will determine the amount of wood left after logging, the reproduction, rate of growth and probable yield of timber after a certain number of years, and will make recommendations as to improved methods of cutting.

ANOTHER COMPANY TO PLANT

The Belgo-Canadian Pulp and Paper Company, Limited, of Shawenegan Falls, Quebec, has decided to commence planting trees on its holdings, making the third large paper company to undertake such reforestation work.

Shelter Belts and Farm Crops

In order that soil may do its best for the average farm crop it is necessary that it contain about half of the water that it is possible for it to hold. When saturated a heavy clay soil will hold 40 per cent. of water, and it is generally agreed that 18 per cent. of water in soil is most favorable to plant growth. A practical farmer needs no measure or scales to tell himwhen his land is in fit condition for sowing, but many a one fails to attach sufficient importance to the necessity for this fit condition, and as a result much good grain and other seed is sown in mud that allowed it no chance of developing into satisfactory crop.

Managing Moisture

The season of 1916 was proof of the fact that in the matter of commanding moisture supply, two points have to be considered, namely, dispersion and retention of moisture. To attain both ends, drainage and mulching have to be practiced, and it is a question if anything more or better than drainage can be made use of or the removal of excess moisture from the soil, but in the matter of retaining moisture or supplying it there are other means than cultivation of the top soil, possible of being used: irrigation is one of these, and another not very often considered, is the provision of tree belts that will help to retain a certain amount of moisture in the atmosphere and so affect the soil beneficially in times of drought.

The Fire Pump in Timber Guarding

An impressive test of the improved design of fire pump on which Mr. Harry Johnson, Fire Inspector, Board of Railway Commissioners, has done such valuable work, was made at Ottawa on May 9th before interested spectators.

The factor of portability has bulked largest in Mr. Johnson's experiments and, of course, has been the chief barrier to the use of any of the existing types of pumps for extinguishing fires in the forest. Last year a most practical experiment was tried by the St. Maurice Forest Protective Association at La Tuque, P.Q., where one of the pumps did splendid service and saved its cost on the single occasion.

This year's design couples the engine and pump direct, the carburetor has been made more get-at-able, and the general efficiency of the engine improved. The test was conducted by placing the pump five feet above the level of the Ottawa River and running 1500 feet of hose on an eighty-two foot rise to a point beneath the Sparks Street bridge. With such severe friction as was offered by the length of hose and with the handicap of the rise, the engine delivered 20 imperial gallons a minute at the nozzle, throwing a stream that approximated thirty to forty feet. The engine and pump weigh 132 pounds and are being adopted in considerable numbers by the Ontario forest service and by private associations in Quebec.

LAVAL MEN APPOINTED

In the new Southern St. Lawrence Forest Protective Association, Mr. B. Guerin is District Fire Inspector of the Western Division with headquarters at Quebec, while Mr. J. D. Brule is Inspector of the Eastern Division with headquarters at Campbellton, New Brunswick. Both officials are graduates of the Laval Forest School where they made a record of distinction.

New Methods of Forest Operating

Lecturing recently before the Natural History Society of Montreal Mr. Gustave C. Piche, Chief Forester of Quebec, gave some most interesting information as to the necessity for changed methods in order to secure the perpetuation of Canada's present forest values.

Mr. Piche estimated that Canada held about 414 million acres of forests, but this supply, he believed, would not last beyond fifty years unless precautions were taken. The methods to be followed for forest preservation were as follows:—

Systematic cutting, based on the maturing growth of the forests.

Proper prevention of forest fires.

Preparation of proper forest reserves.

Reforestation of lands destroyed by fire, or denuded of forests through other means.

Co-operation of all interested for the protection of the forests, and the employment of forestry engineers to deal with the matter of forests.

It was impossible to present an accurate idea of the forests of Canada, in view of the lack of knowledge of some sections of the country, said the speaker. Mr. Piche said that one-third of the country was practically bare of trees. This was the polar section, covered by the Arctic glacial period.

Mr. Piche then dealt with the forests that did exist, speaking of the various sections in the two big classes of forestry that belonged to Canada. He dealt with various types, those in this province, and on the Pacific Coast, remarking that the forests of the Pacific Coast were the richest in the world, being a continuation of the great forests of Oregon and Washington States. He touched on the type of trees to be met with in that region. Mr. Piche then dealt with the forest richness of the provinces in detail.

Mr. Piche, in summing up, said that it had been judged best to reduce the estimate of the forest wealth of the country to 414 millions of acres, but this meant good producing timber. However abundant this forest wealth might seem, it was necessary to take energetic measures as to preservation, and to make an inventory of forest contents with a view to maintaining the supply.

Canada has not one tree too many for present and future needs. We own just one quarter of the timber possessed by the United States. Since pioneer days, the Fire Fiend has robbed us of two-thirds of our original forest inheritance. On what remains the most careful economy will be necessary to meet the increasing requirements of the population. Forest protection, then, is just a matter of good citizenship.

SHANTYMEN'S ASSOCIATION

The ninth annual meeting of the Shantymen's Christian Association was held at Toronto on April 16. The report for the year showed that the work of the association had reached 30,174 men during 1916, in the Prince Albert district of Saskatchewan, the Rainy River district of Manitoba, from Nipigon east to Sudbury, and from Sudbury to North Bay, with North Bay as the centre. During the year ended March 31, 1917, visits were paid to 685 camps, as compared with 355 in the previous year. The staff of the association tramped on foot in order to carry on this work, 1,775 miles. During the year they employed thirteen missionaries, as compared with eleven in the previous year. The subscriptions and collections received during the year amounted to $5,178, as composed with $3,313 in 1916. Officers for 1917 were chosen as follows: President, H. B. Gordon; vice-president, J. J. Gartshore; secretary-treasurer, R. D. Richardson; superin-

tendent, William Henderson; directors: J. McClelland, John Firstbrook, Dr. W. H. Howitt, and Sidney T. Smith. The officers and directors of the general council comprise fourteen members from Winnipeg, Hamilton, Port Arthur, Ottawa, Montreal, and Toronto.

INTERNATIONAL BIRD TREATY

By the recent treaty relating to migratory birds, negotiated between the United States and Canada and ratified by both governments, more than one thousand species and subspecies of the most valuable birds of North America will be protected from the Gulf of Mexico to the Arctic Ocean.

All that remains to complete the work of migratory bird conservation in this country is the passage by Congress of an enabling act to carry out the provisions of the treaty effectively. The efforts of those men who have been responsible for this far-sighted, international agreement are deserving of country-wide recognition.

—"*Our Dumb Animals*"

FOREST GUARDING IN B. C.

(Vancouver Sun).

All who have an interest in the welfare of the province will be glad to learn that more attention is to be given by the provincial government to forest protection. Though money is scarce it must be found for forest conservation. Canada lost by forest fires in 1916 $9,000,000, more than six times as much as has been spent on forest protection work. Most of these fires were preventable. In British Columbia, owing to the efficiency of the forest protection service, and to somewhat more favorable weather conditions, the number of fires last year was only about half that of the previous year. Yet the loss was very considerable and a better protection service would have meant fewer fires and less fire loss. Money devoted to the extension of forest protection is well spent indeed.

The presence of a protective force, the construction of trails, and lookout towers connected to headquarters by telephone, are merely for the purpose of dealing efficiently with the fires that break out. A more important measure is to reduce the quantity of dry material on the forest floor, reducing the danger of fire, and diminishing the heat of fires that do start, so that less injury is done to the trees and soil.

PUBLICITY AND LUMBER SALES

The value of advertising in the lumber field was brought home to the North Carolina Pine Association at its recent annual convention by the report on advertising and the other work of the promotion department. The association is convinced of the value of advertising, and its devotion of a part of the advertising fund to newspapers has been an important feature in the new field of lumber advertising to the ultimate consumer, a campaign now spreading through all the lumber associations of the country. The experimental work with the newspapers was in Sunday editions. Over 100,000 pieces of mail matter were sent to architects and contractors, and nearly 65,000 to retail lumber dealers. The answers received from advertisements were as follows:—

From technical and special circulation magazines from March 1, 1916, to Feb. 28, 1917	3,773
From Sunday newspaper advertisements	1,756
From farm paper advertisements	2,082

NEWS AND VIEWS WANTED!

Readers will greatly assist the Canadian Forestry Journal by sending to the Editor news and pictures of private woodlands, unusual stands or single specimens of trees, or such other subjects as may be judged of general interest.

Six-Sevenths of U. S. Fires Preventable

In most of the forest regions the weather conditions in 1915 were favorable for the prevention and suppression of forest fires, the Lake States being especially favored. There were no protracted droughts, though a few States experienced short periods of intense dryness and of high winds in the spring months. For in about 6,000,000 acres, or 1.1 per cent. of the 544,000,- nd Connecticut occurred in March and April, and 67 per cent. of the 1,101 fires in Pennsylvania in April.

The returns from the States having forest-fire protective systems show that most of the fires were controlled before gaining much headway, and that extensive and destructive fires were few in number, as compared with those in the States not so organized. These facts argue strongly for appropriations for the establishment of adequate systems of protection by all States. The suppression by a forest officer of a single fire in its incipiency may avoid a loss much greater than the annual appropriation for forest fire protection.

It is estimated that some 40,000 fires burned over about 6,000,000 acres, or 1.1 per cent. of the 544,400,- 000 acres of forest area in the United States. Of course, not all the timber on the land burned over was destroyed or damaged; in many fires the damage to standing timber is relatively small. Nevertheless, the money loss in timber and improvements alone was not less than $7,- 000,000 which does not include the loss in young tree-growth on large areas outside of the National Forests, and the very great damage from soil deterioration and floods.

Seventy-four per cent. of the fires were of known origin, and of these lightning—the only nonpreventable cause—started approximately one-seventh. Therefore the remaining six-sevenths were started by carelessness in some form or another, which is preventable. Of these the largest number was caused by brush burning and railroads. The proportion of fires due to these two largely preventable cases indicates strikingly the need for greater care on the part of both farmers and railroads. In the west the principal preventable cause was camp fires. Six out of every seven forest fires which occur can be prevented.—U.S. Dept. Agriculture.

450 PER CENT. JUMP IN PAPER

London, May 2.—The Express says that there is an acute crisis in the paper trade in Great Britain owing to submarine activities, and that imports of raw material have almost stopped. Several paper mills have been obliged to close, and imports in the last few weeks were only ten per cent. of the restricted amount allowed by the Government. There is no prospect of improvement, as every ton of shipping will be needed henceforth for food. A further reduction in the size of the newspapers is considered inevitable. Paper, which before the war cost the newspaper publishers two cents a pound, is now nine cents.

A Correction

By an error in the last issue of the Journal the name of Mr. A. Clarence Lyman of Montreal was omitted from the list of Life Members joining in 1917.

Bad conditions in the principal forest-using industry, lumbering, are of no permanent benefit to anyone. Suspicion and hostility toward this industry will not help the public and get nowhere in meeting practical needs. It should be the concern of the public not only to keep the industry competitive but to cooperate with the lumberman in making his business more efficient.—*Wm. B. Greely, U.S. Forest Service.*

Reforesting Norway With Douglas Fir

Douglas fir is recommended by Anton E. Smith, chief forester at Stavanger, for the reforestation of western Norway, whose former wealth of oak forest was exhausted hundreds of years ago. Mr. Smith is just returning to Norway after a year's study of American soft woods for the Norwegian government. He spent most of his time in Oregon, Washington, British Columbia and Alaska. The climate of western Norway is very similar to that of the states of the Pacific Northwest. Accordingly, Mr. Smith recommends Douglas fir, which, he believes, if planted in Norway, will attain merchantable size in about 80 years.

Norway has been cutting very heavily during that last decade, and the government has taken effective steps to safeguard the nation's timber supply, both by encouraging reforestation and by limiting the cutting to trees above 6¾ inches in diameter, measured five feet from the ground. Both pine and spruce are employed for paper making, the principal use to which timber is put.

Hungry? Try Shredded Birch-O!

Some suggestive experiments have been recently carried out in Germany by G. Haberlandt, partly under official auspices, on the possibility of utilizing wood as food for animals and man. The first experiments were made on a sheep, in a respiration chamber, for the purpose of determining the digestibility and nutritive value of birch wood. The trees were felled in the early spring, and the trunks, measuring four to six inches in diameter, were reduced to very small chips in a paper mill. Microscopic examination showed that the wood was very finely divided, so that the membranes of nearly all the cells were destroyed, while the cell contents had been almost all removed by the water used in the preparation of wood. Thus the residue consisted chiefly of cellular membrane. The wood was fed in combination with other foods. Good results were obtained, both as to digestibility and nutritive value. Apparently the reason why previous experiments on the same subject had not been successful was that the wood was not cut up fine enough and its cells were not thoroughly torn. The experiments were repeated by Prof. Rubner on a dog, the same wood ration being fed with meat, and the results were also successful. Haberlandt believes that man is capable of digesting finely ground birch wood, and that it might replace rye or wheat to the extent of ten or fifteen per cent. in bread making.—(Scientific American.)

AEROPLANE FOR SURVEY

A small aeroplane, to be used this summer in survey and reconnoiter work in the engineering summer camp in Kittitas county, is being constructed by J. W. Miller, assistant professor of civil engineering at the University of Washington. Mr. Miller will complete his machine sometime in May and if tests on the campus show it to be successful, he will take it to the camp.

The machine will have a spread of 24 feet and is designed to carry the aviator and 200 pounds of baggage. A low power rotary motor will be used in an attempt to get a slow speed airship.

J. R. BOOTH—90 YEARS OLD

A mammoth bouquet containing four score and ten American Beauty roses was the tribute of affection that employees of the Booth paper and lumber plants bestowed upon their aged employer John R. Booth, Canada's lumber king when he attained his ninetieth birthday in Ottawa on Thursday, April 5th.

Coincident with the ninetieth anniversary of his birth, John R. Booth made an unusual departure from his steadfast custom and "laid off" for a short time, but, he had a perfectly good reason for doing so. The occasion of the "lay off" was not occasioned by any desire for celebrating the anniversary of his birth, but, was for the purpose of saying "good-bye" to his nephew—Major Gordon Fleck of "A" Company, 231st Vancouver battalion—who passed through Ottawa on his way to Berlin via the western front. Had it not been for the departure of his nephew, it is

probable that the ninetieth anniversary of the "lumber king's" birth would have passed without undue significance, for in the words of one of his workmen, "He's a fine man, but, he works hard."

Before the date of the ninetieth anniversary was over it is said John R. Booth, Sr., was back at his plant busy in superintending the operations of workmen in the erection of a new sulphite mill. It was 6.30 p.m. Wednesday before Mr. Booth considered it a "day's work."

QUEBEC TO SELL LIMITS

According to an announcement made in Quebec recently, the Minister of Lands and Forests will offer for sale a large area of timber limits situated in different parts of the province, mainly in the Lake St. John region, the Saint Maurice Valley and in the Ottawa Superior district.

The numerous demands that have been made upon the Forest Department for over a year are said to justify the Provincial Government in making this sale, for which the time could not be better chosen. Quebec possesses an immense forestry domain a large part of which has remained unproductive up to the present. The present occasion is regarded as the most favorable for opening up the industry.

"Apart from the considerable revenue that this sale will give the province, as well as the cutting dues, etc.," says Pulp and Paper Magazine, "the Provincial Government will have the satisfaction of knowing that they are developing the forestry resources of the provinces, and are contributing to an improvement in the paper situation, and that its policy may tend towards a reduction in the price of this necessary commodity."

ON HEALTH TRIP

Hon. G. Howard Ferguson, Minister of Lands, Forests and Mines for the province of Ontario, is en route for British Guiana in search of health and will be absent several weeks. He was taken till during the session and has not been feeling up to the mark since.

FORESTS OF THE TROPICS

The history of every country in the process of development shows that excessive waste accompanies the exploitation of its natural resources. Primitive people of the tropics, by cutting and burning the virgin forest areas to practice a shifting system of agriculture, have in the past been the greatest enemies of tropical forests. Thus two-thirds of the area of the original forest of the Philippines disappeared before the remainder was brought under forest management. The virgin forest area of countries of Central America and the West Indies had either been completely destroyed or badly damaged.

In temperate countries excessive waste has been the rule everywhere until proper forest policies checked such waste.

The economic development of the tropics will be greatly aided by the avoidance of the mistakes made in handling the forest resources of temperate regions. This can be done only by the adoption of a suitable forest policy during the early stages of exploitation.

What is Needed

What is needed is public appreciation of the value of the undeveloped forest resources and of the possibility of making them a permanent asset. This can be brought about by expert foresters who will not only direct operations in the woods but also arouse the public to the need of forest conservation, and assist in the formulating of a proper forest policy and in the enactment and enforcement of suitable legislation.—*Yale Forest School Bulletin.*

How Timber Is "Cruised"

From "Pointers" by Jas. D. Lacey Co. Chicago

Having a tract of timber to cruise after the most accurate manner practicable in consideration of cost, we first send an expert woodsman, preferably the head cruiser who will be in charge, over the tract to fix upon a general plan of operations and prepare a preliminary report on the character of the timber. This report is the basis of instructions issued to the cruisers. Survey crews are then sent to the tract to locate the corners and lines, established perhaps many years before by government surveyors, and to survey and plainly mark out the minor subdivisions; also to set "tally stakes" for the guidance of the cruiser's compassmen.

When this work is well under way the cruisers are sent in and the actual estimating of the timber begins.

Before the cruiser actually begins the work of estimating the timber, he endeavors first to find windfalls of each species, which are representative types. If this is possible he measures the down tree with his tape. He ascertains the exact butt diameter, having chopped away the bark, and the diameter of each succeeding 32-foot or 16-foot log according to the basis of the estimate. By this method he is able to compute from the standard log scale the exact volume of the tree, taking it log for log, the average taper and the number of merchantable logs it contains. He uses these fallen trees as a standard of comparison by which to judge of the contents, the height and taper of those standing. His experience has taught him that trees of approximately the same age growing under the same conditions, will attain to approximately the same height, and will maintain the same degree of taper. It is vital to the accuracy of his work that the cruiser keep careful watch on the changing age, conditions and types of the timber through which he passes in the course of a day's work. Unconsciously he expects to find the tall clean timber in the draws or on well protected benches; while on the poorer exposures his woodsmanship prompts him to look for the shorter and more imperfect specimens. In a country notoriously free from windfalls, as is frequently the case in the western pine, the estimator often carries some one of the numerous mechanical devices designed to determine the height of standing timber. His steel tape is always in use as an aid and a check to his trained eye in arriving at the butt diameters. Experience has made the expert cruiser a good judge of taper—given him the ability to see at a glance whether a tree holds its size well up into the branches or whether it tapers off rapidly and fails to contain the amount of lumber that its butt diameter would indicate.

Years of practice have imprinted indelibly on the mind's eye of the competent cruiser certain forms and types and sizes, which to him represent certain known contents, and subconsciously these form standards of comparison upon which he bases his estimate upon given trees. By frequent reference to his volume table he has come to know, for example, that a tree 24 inches in butt diameter, containing three 32-foot logs with an average taper of 4 inches of the log—will cut 1,000 feet board measure, also that a tree 31 inches in diameter, four logs high, with a 5-inch taper contains 2,000 feet. Such standard trees are simply an index upon which to work; a rule of thumb, as it were, to systematize and simplify the work of the estimator and to add both speed and accuracy to his efforts. In other words, they serve to standardize his judgment. Should he find trees defective or malformed, he must deduct accordingly. Further, should he find trees that are seriously affected by fungi or any similarly serious diseases peculiar to certain species, he disregards them entirely.

FOREST SCHOOL IN SIBERIA

The board of directors of the Vladivostok Commercial School at Vladivostok, Siberia, will transform the school into a polytechnical institution with several departments, among which the forestry branch will occupy a prominent place.

J. H. WHITE APPOINTED

Mr. J. H. White, lecturer in botany and forestry in the University of Toronto, has been appointed Assistant Provincial Forester for Ontario. Mr. White has already assumed his new duties, in association with Mr. E. J. Zavitz, Provincial Forester for Ontario. An arrangement has been made whereby Mr. White will also be able to devote four hours a week to work in connection with the Forestry Faculty of the University.

MUNICIPAL CAMPS

Fresno, California, has secured the use of 15 acres on the shores of Huntington lake, in the Sierra national forest, on which to establish a camp to provide summer outings for 11,000 school children and their parents. California State Normal School now occupies a portion of the same forest. In connection with the regular six-weeks summer course, this school gives a course in woodcraft and general forestry subjects. The students visit the nearby Forest Service ranger stations and lookout towers, and study the Government's methods of fire protection.

Problem of Over Ripe Timber in B.C.

That British Columbia stands today in greatest possible need of expert forestry, if for no other reason than getting the over-ripe forests of big timber off the ground so that the vast areas shall no longer be idle land, but producing forests for the wants of the coming generations, was a statement made by M. A. Grainger, chief forester for British Columbia, before a meeting of the Natural History Society, of Victoria, B.C. recently.

The proper business of forest land is to grow wood, as much wood as possible each year," said Mr. Grainger, "and once you get to the stage where there is no yearly increase in the wood on any acre, you are wasting the productive power of that acre. These over-ripe forests are simply timber storehouses. In British Columbia we figure that over half of the productive powers of our forest land is being wasted in this way now. There's no market for ripe lumber, and it can't be cut; that is one reason why you see the forest service trying to get more markets for British Columbia lumber to be sold in.

When Increase Stops.

"Practical tests on this coast have shown that the total amount of wood per acre of forest land ceased to increase much sooner than might be expected. To take, for instance, the Douglas fir, one might start with 300,000 little trees per acre. In the course of 20 years there would possibly be only a few hundred of the fittest left. The elimination would be gradual and continuous, until in the course of 300 or 400 years the logger would find but 10 or 20 big trees left.

"The quantity of wood standing on an acre increased steadily, while the stronger little trees grew up and destroyed the weaker ones until at the end of 100 years there would probably be as much timber on an acre as would make 100,000 feet of lumber. After 100 years, on the average, the quantity of wood would not increase; the trees would get bigger each year, but the loss by decay would offset the growth. It was there that practical

expert forestry should step in to market the trees as fast as they reached marketable value and make way for a greater production of the land.

Weed Trees.

Just as weeds come in the garden to choke out the plant growths that were wanted, there are certain forms of forest growth that are undesirable, or at least less profitable. In the case of cedar, for instance, it is difficult to get new cedar growths without having them crowded out by hemlock. The problem is to get the one without the other. Jack pine is a prolific weed in the forest. In size it is only good for railway ties or mine props, yet its thick growth has monopolized much land that might be bearing good yellow pine, spruce, fir or larch. A great deal might be done to encourage the growth of the western soft pine in the interior and the perpetuation of the valuable Sitka spruce was a matter about which very little is known at the present time.

Stock-Taking.

"It can thus be seen that there is an immense field for important work to be done in the forestry service. Not the least important work should be the stock taking of our forest resources so that we may know the facts about the present timber crop and about the timber that is growing up to take its place. Land suited for agriculture must be located and separated from the areas that should be set aside for the perpetual growing of timber because they will not grow anything else.

"The development of British Columbia forestry will depend on technically trained men," said Mr. Grainger in conclusion, "and some means of training these men must be provided. At present our boys must go back east or to the United States to get their training. The British Columbia university—which provides training for teachers, for mining and civil engineers, for agriculturists—will not, I hope, remain long without a forestry school for training men to handle one of the biggest natural resources that any country has ever had."

DOES BARK SCRAPING HELP?

The following question and answer from "American Forestry" will interest many readers:

"Q. I wish to obtain your opinion relative to the practice, now so common, of scraping the outer bark from our shade trees for the purpose of removing scale and other insects, and furnishing no places for their concealment. Many of our most beautiful shade trees, generally elms, have been given this treatment and occasionally the trunk is afterwards painted with some insecticide. All this operation entails great expense to the tree owner. Personally I have been opposed to this treatment of trees, but I would appreciate a discussion from you on the subject.—W. W. M., Chicago, Illinois.

"A. There is no justification for the practice of scraping the bark of shade trees. It does no good and sometimes does harm and many varieties of shade trees, such as Norway maples, Oriental planes, etc., very seldom have any scale insects on their trunks. If you spray the infested trees with oil solution at the proper time, especially when the young scale insects hatch and become active, you will generally catch most of the insects, no matter where they are—under the loose bark or on top of it. Scraping off the old bark exposes very suddenly the young, tender bark underneath to sun, heat and dust and smoke, and produces better bait for scale insects than the old bark because scale insects prefer to live on young, tender bark. We think that if you would allow nature to take care of the loose, superfluous bark and not scrape it off prematurely, the trees would be better off."

The Green Timber of the Heights

(BY A. J. C.)

In spite of an early start and steady climbing, it was nearly noon when we broke from the last thicket of young hemlock and gazed out over a fireswept hillside; a desolate scene of charred stumps and outcroppings of weathered granite. Our objective point, the timbered ridge that now showed plainly some miles ahead, had long challenged our curiosity; being visible from the lower country as a jagged skyline that varied in hue with the changing seasons from the pure white of its winter robe to the warm purple and gold of a summer sunset, its lights and shadows a daily source of delight and wonder.

Where the Fireweed Grows

It was hot, toilsome work across the path of the fire. The high sun darted his rays against the hillside at right angles and the heat quivered back from bare rock and blackened log as from a furnace. Behind every granite ledge the young fireweed was growing, promising a blaze of color later in the year. Scarcely nine months had passed since the fire had destroyed the growing timber, but small, tender shoots of the hardy willows were already springing from the burnt-out soil, striving to reclothe the naked land and bring back, each in its turn, the insect and bird-life which had fled or been destroyed.

Blue Grouse and Blueberry

A raven, glossy black in the strong light, flew slowly over our heads on heavy wings and perched, like a brooding spirit of destruction, on the splintered top of what had once been a noble tree. We left him, "monarch of all he surveyed," to his dismal croaking and, climbing upward, passed the edge of the burnt area at last and began to force our way once more through the familiar tangle of saplings and brushwood. Although not a bird was visible, the dreamy, monotonous call of the mating blue-grouse boomed and echoed all about us, vibrating through the warm, still air. We stumbled through vegetation containing many plants seldom found in the lower country. The devil's club spread its trailing limbs in a trap for the unwary, the broad leaves concealing the long sharp thorns which lay in waiting beneath. In every open glade the highbush blueberry blossomed, and right well did we mark the patches for our guidance in the fruiting-time.

Deep in the Forest Primeval

Our day of rambling and exploration was far spent when the thickets abruptly gave place to a cool, twilight forest of gigantic trees and the ground, clear of underbrush and carpeted with brown needles of the fir, stretched level before us. We were on the ridge! Untouched by axe or fire, rising, massive and straight until their heads were lost in one canopy of foliage, these stately trees formed a 'forest primeval" such as few parts of the world can show. The change from our usual surroundings in the second-growth woods along the shore was so great that it seemed as though we had passed at one step into a foreign country. We moved forward noiselessly through the dim aisles of this noble woodland, the springy moss-covered floor deadening all sound. The vast girth and height of the trees, the semi-darkness under the dense roof of their foliage combined with the oppressive silence to give rise to a feeling of reverence akin to that awakened by the arched wonders and pealing organ music of some great cathedral.

When Cook Sailed Straits

The memory of that scarred hillside was still vivid; and to us, as woodsmen, there came a mental picture of a hurricane of fire roaring through this virgin forest, the heritage of generations to come, and destroying these mighty trees, unmatched in all the world, the outcome of centuries of growth, which, in their sapling

age, stood looking out over the blue straits when Cook dared the perils of reef and shoal.

It is early in the year to be thinking of bushfires when every south-easter still brings its drenching rain and the thickets steam under an hour of warm, spring sunshine, but, sooner or later, the period of danger will come, when the unreckoned wealth and the beauty of our woodlands will lie at the mercy of every careless, unthinking camper. The need for prevention is greater than ever this year. One by one the best of our sturdy fire-fighters of other days have heard the call, and gone to face another foe. In many outlying districts it will be but a scanty force that will muster with axe and mattock at the warden's summons. If there be one man who thinks it is not worth while, and who feels no responsibility in the matter, let him, at the first opportunity, take a "hike" up into the virgin woods, at the heels of a veteran timber cruiser, and he will be sluggish of blood and thick of head indeed if he come not back a determined and voluntary forest-guard.

Advertising to Head off Fire Season

The wholesale and retail lumbermen of Canada are being asked this month by the Canadian Forestry Association to give effect to a new plan in forest protection publicity which should prove of utmost value.

Most firms carry advertising contracts in local newspapers. The association has prepared a special 'Forest Protection' advertisement and the lumbermen are requested to substitute this message for their regular 'copy' once or twice a month between May and October. Even where the town is far removed from standing timber, the attention of many campers, prospectors, hunters, etc., will be drawn to the argument for "Thrift In Forest Fires for 1917."

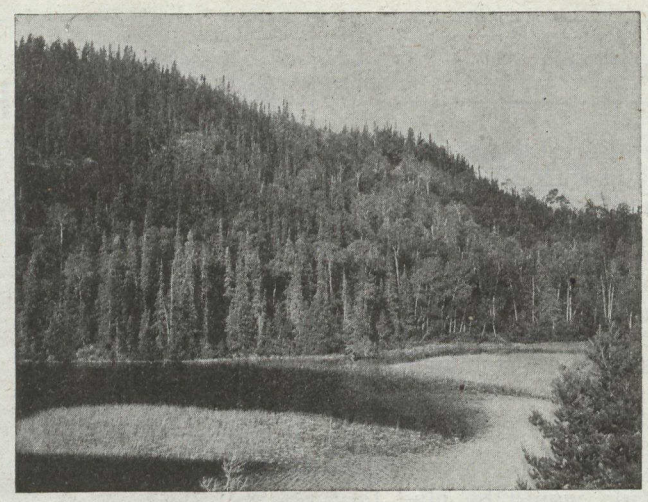
AN APPEAL TO CAMPERS.

The Canadian Forestry Association is endeavoring to secure the co-operation of Canadian fishermen, hunters and campers in making a special effort to adopt fire prevention this year as one of their personal contributions to national thrift.

Names and addresses of three thousand guides and sportsmen have been received, all of whom will receive a personal appeal to keep fire out of the forests in 1917 in-so-far as lies in their power.

The Association would be glad to hear from Quebec, New Brunswick and Nova Scotia members who are in a position to distribute special literature to campers and others, or who know of organizations of guides that can be brought into touch with fire prevention work.

A general newspaper and magazine campaign has been carried on this month, hundreds of newspapers from coast to coast assisting the Association by printing special articles appealing to pleasure seekers to take care of their camp fires and to adopt every precaution with fire in any form.



Courtesy, G. T. Railway.

HEAD OF LADY EVELYN LAKE, TEMAGAMI, ONTARIO.

PLANTING TIME!

THE French Ambassador at Washington some years ago speaking of his acquaintance with trees remarked; "When I was a boy I planted a tree, so small I could hardly see it. A little while ago I went to learn how my boyhood friend had flourished; it had grown so big it could hardly see me."

This is Planting Time with the Canadian Forestry Association's Membership Roll. Since the commencement of 1917, extensive propagandist work has been carried on in most of the provinces. Everywhere the forest conservation cause is taking a remarkable hold on public sentiment. But the process of education must be widened and strengthened.

Your very best service for national conservation is to bring your neighbor into the Canadian Forestry Association. Our members aim to secure 1650 new members before the year closes. To make that as simple as possible, we have this Special Plan to place at your disposal.

ASK YOUR NEIGHBOR TO STAND BY THE CANADIAN FORESTRY ASSOCIATION UNTIL THE END OF 1918 AND ACCEPT ALL OUR PUBLICATIONS, INCLUDING 18 NUMBERS OF THE CANADIAN FORESTRY JOURNAL.

He will thank you for the suggestion. Immediately you send in his name he will be made a member.

The only call upon him for money will be a memorandum for $1.50, posted to him in January next year.

Name of new member:.....

Address.....

.....

Name of new member:.....

Address.....

.....

Sent in by.....